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INVESTIGATION OF A
LARGE-SCALE MIXED-COMPRESSION
AXISYMMETRIC INLET SYSTEM
CAPABLE OF HIGH PERFORMANCE
AT MACH NUMBERS 0.6 TO 3.0

by Norman E. Sorensen and Donald B. Smeltzer

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Moffett Field, Calif.

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#### SUMMARY

A model of a mixed-compression inlet with a 20-inch-diameter capture area was designed and tested in combination with three subsonic diffuser designs. The shortest inlet system was about 1.50 capture diameters long measured from the cowl lip to the engine face and employed vortex generators just downstream of the throat to reduce the total pressure distortion at the engine face. The other two systems were 1.75 capture diameters long and did not employ vortex generators. The supersonic portion of the inlet was designed for Mach number 3.0 and was capable of performing at off-design Mach numbers by translation of the cowl. The major objective was to investigate relatively short axisymmetric inlet systems capable of high performance over the complete Mach number range. The model was tested in a wind tunnel at Mach numbers from 0.6 to 3.2 and angles of attack from 0° to 8°. The Reynolds number was about 2×10<sup>6</sup> per foot at Mach number 3.0.

The supersonic diffuser of the inlet was designed with the aid of a computer program employing the method of characteristics. Preliminary tests showed that the supersonic portion of the inlet performed as predicted, but the flow separated in the subsonic diffuser limiting the performance at the engine face. The subsonic diffuser was then modified and the total-pressure recovery was raised to 90 percent with about 11 percent boundary-layer bleed mass flow from 86-percent recovery with 13-percent bleed. Off-design total-pressure recoveries were also improved about 4 percent over the Mach number range 1.55 to 3.0. The 1.50 capture diameter inlet, with vortex generators, showed an additional 1-percent improvement in recovery, but of more significance was the reduction in total pressure distortion at the engine face. The distortion was reduced to 6 to 7 percent from about 10 percent and the maximum recovery was improved to about 91 percent with about 11-percent boundary-layer bleed mass flow. Without the generators the distortion of the 1.50-diameter inlet was about doubled (14 percent).

The test results in the Mach number range 0.6 to 1.2 included details of experimentally measured additive drag. It was found that there was an optimum trade of additive drag for pressure recovery.

<sup>\*</sup>Title, Unclassified.

#### INTRODUCTION

One of the important elements of a supersonic propulsion system is the inlet. Satisfactory performance of the system usually depends upon a high level of inlet performance not only at the conditions for which the system has been optimized, but as in the case of a supersonic transport vehicle, over the entire mission. When the performance of a vehicle is considered, the weight of the inlet is important. A short inlet, of course, tends to weigh less than a long inlet, but also tends to make high performance difficult to attain. This has presented a challenging problem, the solution of which was approached through a theoretical and experimental research program with a large-scale axisymmetric inlet model. The major objective of the program was to investigate relatively short axisymmetric inlet systems theoretically capable of high performance over a wide range of Mach numbers.

The axisymmetric inlet model chosen for study was a mixed compression type. The supersonic portion of the inlet was designed for Mach number 3.0. Performance at off-design Mach numbers was accomplished by translation of the cowl. Three variations in subsonic diffuser design were tested in combination with virtually the same supersonic diffuser. The initial subsonic diffuser proved to be deficient, as indicated by preliminary test results, and led to a modification which produced more satisfactory results. A shorter subsonic diffuser was then designed and tested with vortex generators. The generators were mounted just downstream of the throat region to reduce the total pressure distortion at the engine face. Boundary-layer bleed configurations were developed for Mach number 3.0 and were tested at off-design Mach numbers without change. By controlling the bleed plenum chamber pressures, a range of bleed mass-flow ratios was investigated for a given bleed configuration. Tests were conducted over the Mach number range 0.6 to 3.2 at a tunnel total pressure of 30 inches of Hg. This corresponded to a Reynolds number of about 2×106 per foot at Mach number 3.0. The tests were conducted primarily to determine the performance parameters of engine-face total-pressure recovery and distortion as a function of boundary-layer bleed mass-flow ratio at angles of attack from 0° to 8°. The transonic tests included experimental determination of the additive drag. Theoretical predictions based upon the method of characteristics were compared with the experimental results. A small portion of the results presented herein is also presented in references 1 and 2.

### SYMBOLS

A<sub>c</sub> capture area, 314.16 sq in.

 $A_{\mathbf{X}}$  local duct area normal to the inlet centerline, sq in.

ъ̃ span of the vortex generators, in. additive drag coefficient based on Ac  $^{\mathtt{C}}\mathtt{D}_{\mathbf{a}}$ net-thrust coefficient based on Ac  $c_{FN}$ D capture diameter, 20 in. h local rake height, in. free-stream Mach number  $M_{\infty}$ free-stream Mach number decrement from the design Mach number  $\Delta M_{\infty}$ local Mach number M<sub>7.</sub> mass flow m total pressure  $P_{t}$ static pressure р  $\Delta p_{t_2}$ total pressure distortion parameter, local radius  $\frac{\mathbf{r}}{R}$ capture area radius axial distance from the tip of the centerbody capture area radius axial distance from the cowl lip capture area radius axial distance from the cone tip to the cowl lip capture area radius incremental  $\frac{x}{R}$ angle of attack, deg α incipient unstart angle of attack, deg αu  $( \overline{\phantom{a}} )$ average values

### Subscripts

- o inlet lip station
- throat station
- engine-face station
- bl bleed
- local flow
- ∞ free-stream conditions

Note: The letters A, B, C, and D, referring to the boundary-layer bleed exit settings, denote a progressively more restricted bleed flow from A, the fully open exit setting, to D, the most restricted setting. The letter A' refers to a bleed exit setting associated only with the 1.75 D modified inlet.

### DESIGN

Satisfactory performance of a propulsion system usually demands a relatively short inlet capable of high performance at off-design Mach numbers as well as at the design Mach number. The requirement for adequate transonic acceleration led to a design which employed a low-angle conical centerbody to keep the transonic additive drag reasonably small. The requirement for high performance at off-design Mach numbers was compatible with the transonic requirements and led to a supersonic diffuser design with high performance. For the shortest subsonic diffuser the use of vortex generators was vital in achieving low flow distortion at the engine face. The design of the inlet system divided naturally into two parts, the supersonic diffuser and the subsonic diffuser.

### Supersonic Diffuser

This portion of the inlet was designed with the aid of a computer program that employed the method of characteristics. The program proved to be adequate and is fully described in reference 3. Figure 1 shows the diffuser contours with the theoretical network of characteristics and flow properties from the computer program. An initial internal cowl angle of 0° and a 12.5° half-angle conical centerbody were selected to satisfy the important external requirements for low transonic additive drag and low cowl drag. The rest of the contours to the throat were adjusted by trial until the computer program gave the desired theoretical conditions at the throat and sufficiently low pressure rises across the internal shock-wave impingements to prevent boundary-layer separation. The goal was to attain uniform flow in the throat at a Mach number of 1.3 and a pressure recovery above 95 percent. Figure 1 shows that this goal was closely achieved. In addition, the pressure ratios

across the first and second shock-wave impingements on the centerbody were 2.80 and 1.68, respectively, and 2.13 on the cowl. These pressure ratios were judged (on the basis of ref. 4) to be below those for incipient separation of the expected boundary layers. The off-design air flow requirements of a selected turbofan engine were satisfied throughout the Mach number range. The inlet provided 40.5 percent of the capture mass flow at Mach number 1.0. This may not be sufficient for some engines, but a contracting centerbody version of the inlet could provide higher mass flow at all speeds. An additional restraint imposed upon the theoretical design was the requirement that the axial distance through which the cowl had to be translated for off-design operation be kept to a minimum. For this inlet, the translation distance required was about 10 inches or half an inlet diameter. This was believed to be short enough to avoid excessive weight penalties.

### Subsonic Diffuser

Since most of the performance deficiencies found in the initial tests were associated with losses in the throat and subsonic diffuser, three different subsonic diffusers were tested in combination with virtually the same supersonic diffuser. These three designs are shown in figure 2. The initial diffuser and its modification are shown in figure 2(a). The initial diffuser was designed with a linear variation of area from the beginning of the throat at x/R = 3.75 to the engine-face station at x/R = 6.04. The modified diffuser was designed to have a linear static-pressure variation between these stations. The modified design provided a lower rate of expansion downstream of the throat to x/R = 5.20 than did the initial design. After this point the flow expanded rapidly. Because the changes in area distribution between the initial and modified diffusers were accomplished for reasons of expediency by changes in the centerbody dimensions only, the minimum area did not remain fixed relative to the cowl when the cowl was translated for off-design opera-It was recognized that shifting of the minimum area with translation was undesirable, especially from an inlet control standpoint. However, the design was tested mainly to determine the difference in performance with the two diffusers at the design Mach number. The inlet for these two diffusers was about 1.75 diameters long measured from the cowl lip to the engine-face station. The success attained with this modified diffuser led to the design of a shorter subsonic diffuser providing an inlet about 1.50 diameters long, as shown in figure 2(b). The diffuser had a linear variation of Mach number from the beginning of the throat at x/R = 3.75 to the final diffusion Mach number of about 0.3 at the engine-face station, x/R = 5.50. This design provided a slightly lower rate of expansion in the throat region than did the diffuser modified to yield a linear static pressure variation. the throat (x/R = 3.75) did not shift with translation.

The coordinates of the inlets are presented in table I. The contours for the 1.75 D inlets include compensation for boundary-layer growth from the points of the first shock wave impingements on the cowl and centerbody to the throat. The contours for the 1.50 diameter inlet were based on inviscid calculations only.

### MODEL AND INSTRUMENTATION

The model with a 20-inch capture diameter was as large as practical for installation in the Unitary Plan wind tunnels at Ames Research Center. Sketches of the model and instrumentation are shown in figure 3, and a photograph of the model mounted in the ll-foot transonic wind tunnel is shown in figure 4. For structural reasons, the inlet area was varied by translating the cowl rather than the centerbody. The cowl had a sharp 150 lip and could be translated about 18 inches as shown in figure 3(a). The outer shell was attached to four hollow struts mounted on the centerbody sting support. The main duct exit area was controlled by a translating sleeve and a fixed plug. Figure 3(b) shows details of the bleed system. Four separate bleed zones are indicated, each of which had separate and controllable exits allowing the bleed flow to be controlled from maximum flow to no flow. Also, separation of the zones prevented recirculation of the flow from the higher pressure zones in the throat (zones III and IV) through the lower pressure zones upstream (zones I and II). To insure low back pressure at the bleed exits, exit fairings shown in figure 3(a) were provided. The forward bleed areas were designed to be just ahead of the shock-wave impingements shown in figure 1. On the basis of the results in reference 5, this appeared to be an effective means of controlling the boundary-layer growth. Distributed bleed in the throat region provided a variation of bleed flow as the terminal shock wave progressed into the throat region. The porosity of all of the bleed areas was 41.5 percent. The diameter of the holes in bleed zone I was 0.025 inch. diameter of the holes in the remaining zones was 0.125 inch.

The instrumentation was conventional but rather detailed. The main duct instrumentation consisted of six total-pressure rakes for measuring the totalpressure recovery at the simulated engine face. Each rake had six tubes spaced so as to provide an area weighted average total pressure as shown by the sketch in table II. Static pressure rakes (see fig. 3(a)) were stationed near the main duct plug which, in conjunction with the known area at this station and the choked main duct exit area, allowed computation of the main duct mass flow. Static pressure orifices were located in a row along the top inner surfaces of the cowl and centerbody to the end of the subsonic diffuser. Two boundary-layer rakes were located on the centerbody and one on the cowl as shown in figure 3(b). Two pitot pressure rakes at the beginning of the throat measured the performance of the supersonic diffuser. Bleed flow rate in the centerbody boundary-layer removal ducts was measured by three total- and static-pressure rakes in the outer duct and four in the inner duct. Bleed flow rate measurements through the two zones on the cowl surface were made by the use of measured plenum chamber pressures and the known choked exit areas. Pressures were also measured in the centerbody plenum chambers. For the transonic tests, four rakes were installed at the point of maximum centerbody diameter. Pressure measurements from these rakes were used to calculate both the inlet mass flow and the total momentum change from the free stream to the inlet lip.

Vortex generators were installed about two throat heights downstream from the beginning of the throat of the 1.50 diameter inlet. Forty generators were mounted on the centerbody and 54 on the cowl. Other details of the generators

are shown in figure 3(b). The vortex generators were selected in accordance with reference 6. Vortex generators were not used with the 1.75 diameter inlet systems.

### MEASUREMENT TECHNIQUES AND ACCURACY

As with most inlet tests of this type, a problem was encountered in accurately determining the mass-flow rates through both the main duct and the various bleed systems. The calibration factor for the main duct flow metering system was found to vary with main duct plug position, Mach number, and boundary layer bleed mass flow. No calibration factor was found that would yield better than approximately ±2 percent accuracy in the main duct mass flow. Special care was taken in calibrating the bleed mass-flow measuring systems. Each system was calibrated in the wind tunnel at Mach 3.0 and  $\alpha = 0$ . The technique consisted of varying each bleed exit from open to fully closed and then plotting the computed bleed mass-flow ratio against the incremental change in main duct mass flow. This method yielded bleed calibration factors which gave consistent results when all the bleed mass-flow rates were summed and compared to the difference between the known capture flow  $(m_0/m_{\infty} = 1.000)$ at M = 3.0) and the measured engine-face mass flow. The bleed flow calibration factors thus determined were used for data reduction at all Mach numbers. No attempt was made to calibrate the bleed flow measuring systems at angle of attack, but the calibration factors were believed to be as accurate at 20 as at 0°. In the transonic Mach number range from 0.6 to 1.3 bleed flow was not measured. For the transonic tests the inlet mass flow was measured by the four rakes mounted just ahead of the throat (see fig. 3(b)). Additive drag was computed by the methods described in reference 7, from the total momentum change of the inlet mass flow (determined from the rake measurements), pressure forces on the compression surfaces, and estimated friction forces acting on the surfaces. All other measurement techniques were conventional and the estimated accuracy of the measured quantities is as follows:

$$p_t/p_{t_{\infty}} = m_{bl}/m_{\infty} \qquad \alpha \qquad p/p_{\infty} = M_{\infty}$$
 Accuracy at  $\alpha = 0^{\circ}$   $\pm 0.005$   $\pm 0.005$   $\pm 0.1^{\circ}$   $\pm 0.2$   $\pm 0.05$ 

Tunnel total pressure was 15 psia for all tests.

### RESULTS AND DISCUSSION

Much of the data obtained was of limited interest and has been plotted in appendix A or tabulated in table II. The method for determining optimum performance based upon a combination of transonic additive drag and total-pressure recovery is discussed in appendix B. The discussion to follow has drawn certain results from these appendixes for comparison and illustration of the more significant factors.

Most of the inlet development effort was directed toward attaining high. performance at the design Mach number of 3.0. The bleed configurations and the bleed exit settings that controlled the bleed-flow rates were established at Mach number 3.0, and the inlets were tested without change of the bleed exit settings at off-design Mach numbers. No attempt was made to improve the off-design performance with other boundary-layer bleed configurations. The modified version of the initial diffuser (1.75 D) was not considered suitable for off-design operation since its throat did not remain fixed relative to the centerbody at off-design conditions. Most of the results presented for this design are therefore limited to Mach number 3.0. The results for the 1.50 diameter inlet are presented in more detail since the throat remained fixed relative to the centerbody throughout its operating range. The presentation of the transonic results is treated differently from the results at higher Mach numbers because a determination of the trade-off of experimental additive drag versus pressure recovery at the engine face was required in order to optimize net propulsive thrust. This involved the use of typical engine data and an assumed flight profile to obtain realistic values of thrust. The optimization procedure is presented in appendix B.

## Performance at $M_{\infty} = 3.0$

Because of control margin requirements an actual propulsion system may not operate at the maximum inlet pressure recovery. However, the maximum recovery serves as an indicator of the capability of the inlet. All inlets were designed with a throat Mach number of 1.3, but a lower Mach number (1.2 or less) was required to achieve maximum pressure recovery. For tests of the initial and modified inlets (1.75 D) this occurred with the bow shock wave impinging 0.075 x/R inside the cowl lip. This represented more geometric contraction than was expected even allowing for the lower throat Mach number of 1.2 or less. The additional contraction was thought to be caused by overcompensation of the boundary layer due to the geometric compensation introduced into the contours. For this reason compensation was not included for the shorter inlet (1.50 D). For this inlet maximum pressure recovery was attained with the bow shock wave impinging only 0.045 x/R inside the cowl lip. This again represented an additional contraction required to obtain maximum pressure recovery. With the inlet system operating under these conditions and with the terminal shock wave systems in the more forward position in the throat, an envelope of the maximum pressure recovery and corresponding total pressure distortion measured for several combinations of bleed exit settings and bleed configurations is presented in figure 5. For the initial tests a maximum recovery of 86 percent with 13-percent bleed mass flow and about 10-percent distortion at the engine face was attained. Since recoveries as high as 97 percent were measured for the supersonic diffuser, the main loss in performance was attributable to flow separation in the throat and subsonic diffuser. This led to the modification of the subsonic diffuser from one based on a linear area variation to one which gave a linear static pressure variation. This greatly reduced the initial rate of diffusion in the throat region as shown in figure 2(a). With the modified diffuser a range of maximum recoveries was attained up to a little over 90 percent with about 11-percent bleed (fig. 5). For this condition the distortion was about 10 percent, the lowest attained with this diffuser. With the shorter diffuser employing

vortex generators, the distortion was lowered to between 6 and 7 percent for the same bleed flow while the recovery was increased about 1 percent to 91 percent. This latter result was attributable to the better distribution of the flow energy induced by the vortex generators through turbulent mixing of the high energy core flow with the boundary layer in the throat. Results of supercritical operation for the modified and 1.50 diameter inlet systems are compared in figure 6. They show a continuation of the better performance with the 1.50 D inlet. Not only did the recovery remain about 1 percent better as the terminal shock wave system moved downstream, but the distortion also remained at or below 10 percent over the useful supercritical range. a typical result with vortex generators as can be seen in figure 7 where the results for four bleed exit settings are plotted. These curves show that the performance is still largely a function of boundary-layer bleed. The effect of the vortex generators is shown by comparison of the performance with and without generators shown in figure 8. The use of vortex generators in this short diffuser improved the pressure recovery by about 1 percent, but more significantly, the distortion was markedly reduced from about 16 to about 7 percent for conditions near maximum recovery. An examination of the detailed pressure recovery plots from the engine-face rakes shown in figure 9 reveals the nature of the distortion for the maximum pressure recovery points of the previous figure. Radial distribution of pressure recovery for each of the six engine-face rakes is plotted and shows radial distortion values as low as 2 percent. The greatest radial distortion with the vortex generators installed was 6.3 percent (rake no. 6) which was about equal to the total distortion (fig. 8). This suggests that local tailoring of the generators or inlet contours or both might reduce the total distortion to 5 percent or less. Because distortions this low appear possible and since most engines are designed to operate without any performance penalty with up to 10 percent distortion, even shorter subsonic diffusers may be practical.

Figure 10 shows typical variations with engine face total-pressure recovery of the bleed flow through the individual bleed zones. Bleed in the region of the throat (zones III and IV) changed with engine-face pressure recovery as a result of the change in position of the terminal shock wave in the throat. As the terminal shock wave moved upstream into the throat area and passed over the bleed holes, the higher pressures behind the terminal shock wave forced more air out of the bleed holes. The change in engine-face mass flow with pressure recovery was thus due almost entirely to the change in bleed flow through zones III and IV. (The bleed flow through zone II can increase slightly with the terminal shock wave in its most forward position.) As illustrated by the data of figure 10, the boundary-layer removal required from the centerbody surface was greater than that required on the cowl. This was because of the relatively longer boundary-layer run on the centerbody and the two shock impingements on the centerbody boundary layer whereas only one occurred on the cowl. Boundary-layer measurements at several stations on the cowl and centerbody are shown in figure 11. Comparison of the pitot pressure profiles at the two stations on the cowl surface indicated that the boundary layer was thin and well controlled by the bleed through zone I. On the centerbody a similar comparison showed considerably thicker boundary layers at the throat survey station. The relatively thick boundary layer in the throat was believed to be caused in part by the lack of boundary-layer removal near the first shock-wave impingement on the centerbody. Comparison of the

boundary-layer pitot pressure profiles shown in figure 11 on the centerbody ahead of and behind this impingement (approximately x/R = 3.200) indicates a sudden thickening of the boundary layer but does not indicate separation. Consequently, about two-thirds of the total bleed was required on the centerbody.

When the performance penalties associated with boundary-layer removal are estimated, it is necessary to consider the amount of bleed and also the total-pressure recovery of the bleed flow because the ducting required for the bleed flow is smaller with higher recoveries, and the bleed exit momentum recovery potential is greater. Both factors help to minimize the propulsion system weight and drag. Figure 12 shows typical boundary-layer bleed plenum chamber pressure ratios for each zone for the "B" exit setting. Fortunately, the zone IV centerbody bleed, which had the highest flow rate, also had the highest recovery. In addition, the increase in recovery for zone IV with increasing bleed was favorable because, as shown in figure 10, the increase in total bleed was mostly through zone IV.

Some of the effects of the terminal shock wave system on bleed flow variation have been discussed, but little knowledge of the shock-wave position can be gained without examination of static pressure distributions. For this purpose three typical distributions for the 1.50 diameter inlet are presented in figure 13 to show the positions of the shock waves at three levels of performance. These distributions correspond to performance data shown in figure 6. The measured supersonic static pressure distributions agree reasonably well with the theoretical distributions shown in figure 1, although direct comparison cannot be made because of differences in cowl position. For the experimental results the cowl was translated 0.045 x/R forward of the theoretical design position of figure 1. The theoretically sharp pressure rises at the shock wave reflection points were masked somewhat by the boundary layer, especially in the throat region where the terminal shock wave was in the position for maximum pressure recovery (fig. 13(a)). When the shock wave was farther downstream (figs. 13(b) and (c)) the terminal shock wave pressure rise started close to the predicted pressure level  $(p/p_{co} = 13.0)$  and extended over some length as is characteristic of a shock wave  $\widetilde{\text{train}}$ . As the terminal shock train moved downstream (figs. 13(b) and (c)) the pressure recovery and bleed mass flow progressively decreased as shown in figure 6. As the shock train moved out of the throat region in which the bleed removal holes are located, there was no longer any change in bleed flow and the pressure recovery decreased rapidly. By altering the bleed hole distribution in the throat it should be possible to change the variation of bleed flow with pressure recovery to some extent.

The previous discussion considered only the steady-state performance at  $0^{\circ}$  angle of attack. Of equal importance is the resistance of the inlet to unstarting which might be caused by sudden changes in approaching flow conditions similar to those associated with gusts. A gust can change the local angle of attack suddenly by  $2^{\circ}$  or more. If an inlet can be pitched to this angle or greater without unstarting, it should be relatively insensitive to sudden changes in angle of attack of this order. When operated supercritically with some recovery penalty, the present inlets have remained started up to an angle of attack of  $3.5^{\circ}$ . To illustrate this, figure  $1^{\downarrow}$  has been

prepared in which the pressure recovery for exit settings A, B, and C from figure 7 has been replotted. To facilitate understanding of these curves a detailed explanation of the curve for bleed exit setting A is described. The data points were obtained at  $0^{\circ}$  angle of attack. Starting at  $0^{\circ}$  the angle of attack was increased until the inlet unstarted. At maximum pressure recovery (which represents the most forward position of the terminal shock wave system) an angle of attack of  $0.5^{\circ}$  unstarted the inlet as shown on the curve. If the pressure recovery were degraded a small amount (representing downstream withdrawal of the terminal shock wave system), the angle of attack could be increased to  $\alpha_{\rm u} = 1.5^{\circ}$  before the inlet unstarted. Further reducing the pressure recovery allowed the angle of attack to be increased to a limiting value of  $\alpha_{\rm u} = 3.8^{\circ}$ . At this point further reducing the pressure recovery had no effect on  $\alpha_{\rm u}$ ; it remained constant at  $3.8^{\circ}$ .

Another characteristic of a gust besides suddenly changing the local angle of attack is the possibility of a reduction of the local Mach number. With the inlet operating at peak performance, the throat Mach number was 1.2 or lower; hence, a slight reduction in local external Mach number could cause the throat to choke  $(M_{\rm th} \rightarrow 1.0)$  which would result in unstarting the inlet. Figure 15 shows the maximum recovery of the 1.50 D inlet for several lip positions, the highest recovery corresponding to the  $(x/R)_{\rm lip} = 2.330$  position. Plotted in the lower part of the figure is the Mach number decrement from Mach number 3.0 that the inlet can experience before unstarting. (This curve was derived from the lower curve in figure 16.) For instance, with the lip at position  $(x/R)_{\rm lip} = 2.400$  the inlet remains started as the Mach number is decreased from 3.0 to 2.8. It can be seen that if a gust causing a 0.1 decrement in local Mach number is to be tolerated, the inlet contraction ratio must be reduced so that the maximum inlet recovery is degraded about 1.5 percent.

The cowl lip translation required to restart the inlet is plotted in figure 16 for Mach numbers 1.55 to 3.2. Also shown for comparison is the theoretical lip position for restart which shows that the inlet started with less cowl translation than predicted. This favorable result was ascribed to the bleed flow removed from zones I and II upstream of the throat which decreased the amount of flow that the throat had to pass allowing the inlet to restart with less translation. Because of this, the inlet was self starting (no translation required) at  $M_{\infty}$  = 1.55.

The maximum pressure recovery and flow distortion of the 1.50 D and the modified 1.75 D inlets are compared up to  $8^{\circ}$  angle of attack in figure 17. When the inlet was operated at angle of attack, the maximum pressure recovery attainable was less than at  $\alpha = 0^{\circ}$  as indicated. The performance of both systems deteriorated rapidly above  $2^{\circ}$ , but the recovery of the shorter inlet was about 1 percent better up to  $5^{\circ}$ . Above  $5^{\circ}$  the distortion in the shorter inlet became more serious and the pressure recovery reduced accordingly.

To match an inlet to an engine it is important to know the engine-face mass-flow capability at angle of attack. This capability is presented in figure 18 for the B bleed exit setting. It can be seen that up to  $5^{\circ}$  the mass-flow capability remained fairly high, but at  $8^{\circ}$  the flow was seriously reduced and accompanied by high flow distortion. As mentioned in the section for Accuracy, no attempt was made to calibrate the main duct and bleed flow at

angle of attack, and the error involved in the main duct mass flow at angles of attack above 2° may be as much as 5 percent. The mass-flow values shown at angle of attack should therefore be treated as qualitative.

### Off-Design Performance

Maximum performance of the three inlets is shown in figure 19 for Mach numbers from 0.6 to 3.2. The recovery for the initial inlet remained about 4 percent lower than that for the other two inlets from Mach numbers 1.55 to 3.0. This was attributed to flow separation caused by the rapid initial expansion in the subsonic diffuser as previously mentioned. Use of a linear static pressure variation in the design of the subsonic diffuser provided a low initial rate of expansion in the throat region and produced good performance at design and off-design Mach numbers even though the throat shifted with translation as shown in figure 2(a). The 1.50 D inlet with vortex generators was designed so that the throat did not shift with translation (see fig. 2(b)) and incorporated the low initial rate of expansion in the subsonic diffuser. Its recovery was generally equal to or about 1 percent higher than the modified inlet and the distortion was considerably lower throughout most of the Mach number range. It should be pointed out that the data for  $M_{\infty} = 3.2$  were obtained with the contraction ratio corresponding to that for maximum recovery at M<sub>s</sub> = 3.0. Model design features prevented translating the centerbody to increase contraction ratio which would have increased the pressure recovery. The transonic results from Mach numbers 0.6 to 1.2 were obtained from an optimization procedure with a selected engine as described in appendix B. The transonic data show that the distortion for the shorter inlet with the generators was reduced by about 2.5 percent from that of the modified inlet.

One of the prime concerns in the transonic range was the need for low additive drag as pointed out in the discussion of the design. The consideration of drag alone was not enough, however, to define the best operating condition. As a minimum consideration the effects of pressure recovery and additive drag were optimized for a selected engine to obtain the best operating conditions for a given vehicle flight profile. The additive drag and total-pressure recovery were functions of the inlet mass flow and the cowl position. Positions for minimum additive drag were also those with low recovery as indicated in figure 20. The only realistic way of considering the best combination of recovery and additive drag was to select an engine with a known airflow schedule and optimize the thrust minus additive drag for a given flight profile. In this way the optimized set of curves in figure 20 was obtained. Because of the strong influence of pressure recovery on engine thrust, optimum performance occurs with other than minimum additive drag. Each engine-inlet combination requires a new optimization; hence, more complete data and a sample computation for the results shown in figure 20 are presented in appendix B. The theoretical additive drag shown in figure 20 was computed with the method of characteristics and compares reasonably well with the experimental results. As mentioned in appendix B optimum performance at all transonic Mach numbers occurred with the cowl lip at or near

 $(x/R)_{lip} = 3.50$  while minimum additive drag occurred with  $(x/R)_{lip} = 3.65$ . This reduction in translation of 0.15 x/R could result in a reduction of the inlet weight.

#### CONCLUDING REMARKS

A 20-inch capture diameter model of a mixed compression axisymmetric inlet system designed for high performance from  $\rm M_{\infty}=0$  to 3.0 has been tested. Three relatively short subsonic diffusers have been tested in combination with virtually the same supersonic diffuser. The main conclusions to be drawn from these tests are that the supersonic portion of the inlet performed as predicted, and that the main difficulty in achieving high performance lay in the elimination of flow separation in the throat and subsonic diffuser. Vortex generators located just downstream of the throat were effective over the complete Mach number range in reducing the total pressure distortion at the engine face of the shortest subsonic diffuser tested. Without vortex generators the distortions were high (about double that with generators) and were considered unsatisfactory for most engines. The distortion with the generators was less than may be needed and suggests that even shorter subsonic diffusers are practical.

The inlet with the shortest subsonic diffuser was about 1.50 capture diameters long measured from the cowl lip to the engine face. The supersonic portion was successfully designed with the aid of a computer program employing the method of characteristics. The subsonic diffuser problems were overcome with a design employing a linear Mach number variation from the beginning of the throat to the engine face. This variation allowed a low rate of initial expansion in the throat and avoided flow separation.

The inlet showed good resistance to unstarting which might result from atmospheric disturbances such as gusts. Operation at slightly supercritical conditions with only a relatively small reduction in maximum pressure recovery was needed to maintain started conditions for local angles of attack ranging to  $3.5^{\circ}$ .

Control of the boundary layer has been accomplished with four porous bleed areas. The boundary layer in the supersonic portion of the diffuser was effectively controlled by bleeding just ahead of two internal shock wave impingements. A distributed pattern of bleed in the throat region allowed an increase in bleed flow and engine-face recovery as the terminal shock-wave system moved into the throat. By altering the distribution of the bleed holes in the throat it should be possible to either lengthen or shorten to some extent the distance the terminal shock wave system can travel for a given level of performance.

Ames Research Center
National Aeronautics and Space Administration
Moffett Field, Calif., 94035, Sept. 1, 1967
720-03-01-01-00-21

### APPENDIX A

### PLOTTED DATA

- Figure 21.- Theoretical inlet mass-flow ratio,  $\alpha = 0^{\circ}$ .
- Figures 22(a) 22(h)<sup>1</sup>.- Supercritical performance, 1.50 D inlet with vortex generators,  $\alpha = 0^{\circ}$ , bleed exit settings A, B, and C,  $M_{\infty} = 3.2$  to 1.55.
- Figures 23(a) 23(g)  $^{1}$ . Supercritical performance, 1.50 D inlet without vortex generators,  $\alpha$  = 0 $^{\circ}$ , bleed exit settings A and C,  $M_{\infty}$  = 3.0 to 1.55.
- Figure 24.- Supercritical performance, 1.50 D inlet with vortex generators, bleed exit setting B,  $M_{\infty}$  = 3.0,  $\alpha$  = 0°,  $(x/R)_{lip}$  = 2.320, 2.330, 2.350, 2.370, 2.400.
- Figures 25(a) 25(h).- Bleed zone mass flow, 1.50 D inlet with vortex generators,  $\alpha$  = 0°, bleed exit settings A, B, and C,  $M_{\infty}$  = 3.20 to 1.55.
- Figures 26(a) 26(f).- Pitot pressure profiles, 1.50 D inlet, bleed exit setting B,  $\alpha = 0^{\circ}$ ,  $M_{\infty} = 2.75$  to 1.55.<sup>2</sup>
- Figures 27(a) 27(d).- Bleed zone plenum chamber pressures, 1.50 D inlet with vortex generators,  $(x/R)_{\text{lip}}$  = 2.330,  $M_{\infty}$  = 3.00,  $\alpha$  = 0°, bleed exit settings A, B, C, and D.
- Figures 28(a) 28(d).- Maximum bleed zone plenum chamber pressures, 1.50 D inlet with vortex generators,  $\alpha$  = 0°, bleed zones I, II, III, and IV.
- Figures 29(a-c) 35(a-c).- Static pressure distribution, 1.50 D inlet with vortex generators, bleed exit setting B,  $\alpha$  = 0°,  $M_{\infty}$  = 3.20, 2.75 to 1.55.<sup>2</sup>
- Figures 36(a) 36(g).- Maximum performance at angle of attack, 1.50 D inlet with vortex generators,  $M_{\infty}$  = 3.00 to 1.55.
- Figures 37(a) 37(g).- Maximum performance at angle of attack, 1.50 D inlet without vortex generators,  $M_{\infty}$  = 3.00 to 1.55.
- Figures 38(a) 38(e).- Supercritical performance at angle of attack, 1.50 D inlet with vortex generators, bleed exit setting B,  $M_{\infty}$  = 2.75 to 1.75.
- Figures 39(a) 39(i).- Transonic total-pressure recovery and additive drag,  $\alpha = 0^{\circ}$ ,  $M_{\odot} = 0.60$  to 1.20.

Half-filled symbols on these figures indicate points for which tabulated data are presented.

 $<sup>^{2}</sup>M_{m} = 3.00$  data shown in section on Discussion only.

### APPENDIX B

# METHOD OF DETERMINING THE OPTIMUM COMBINATION OF TRANSONIC

### ADDITIVE DRAG AND TOTAL-PRESSURE RECOVERY

The transonic additive drag and total-pressure recovery were a function of the inlet mass flow and the cowl position. Conditions that yielded low additive drag generally yielded low recovery. The reverse was also true; therefore, the tradeoff between drag and recovery was calculated for an appropriate engine with an assumed flight profile to show an example of the optimum combination of additive drag and pressure recovery. Data needed for optimization at Mach numbers 0.6 to 1.2 are presented in figure 39(a), and an example of the computation procedure is outlined below for Mach number 0.6.

From engine performance data, values of thrust for 100-percent throttle setting were found at Mach number 0.6 at the altitude defined by the assumed flight profile shown in figure 40(a). These values of thrust were corrected for the pressure recoveries for the range of inlet mass flow  $m_0/m_\infty$  shown in figure 39(a). Thrust was converted to thrust coefficient  $C_{FN}$ , and from  $C_{FN}$  the corresponding additive drag coefficient  $C_{Da}$  was subtracted. At this point the engine mass flow demand was checked to see if enough flow was available from the inlet. Since there was ample inlet flow, as shown in figure 20, part was bypassed, producing an additional drag penalty that was not included in the computations. Curves of  $C_{FN}$  -  $C_{Da}$  versus  $m_0/m_\infty$  were determined for each cowl position  $(x/R)_{\mbox{lip}}$  as shown in figure 40(b). For the Mach number of this example the peak or optimum  $C_{FN}$  -  $C_{Da}$  occurred near  $m_0/m_\infty = 0.355$  with  $(x/R)_{\mbox{lip}} = 3.50$ . Then  $C_{Da}$  and  $\mbox{Pt}_2/\mbox{pt}_\infty$  for this point were plotted in figure 20 as were the points for other transonic Mach numbers. For this particular engine-inlet combination the optimum transonic operating points shown all occurred with the cowl lip near the x/R = 3.50 position.

### REFERENCES

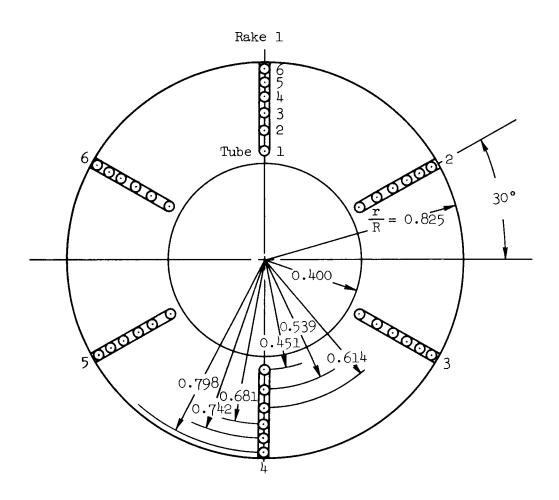
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TABLE I.- INLET COORDINATES

	CENTERBODY		COV	VL
INITIAL	MODIFIED	1.50 D	INITIAL AND	1.50 D
1.75 D	1.75 D	INLET	MODIFIED	INLET
INLET	INLET	TIVILLI	1.75 D INLET	TIMET
		x r	(x) r	/x\ r
$\frac{x}{R}$ $\frac{r}{R}$	$\frac{x}{R}$ $\frac{r}{R}$	$\frac{x}{R}$ $\frac{r}{R}$	$R_{c}$	$\left(\begin{array}{c c} x \\ \hline R \\ \end{array}\right)_{\mathbf{C}} \left(\begin{array}{c c} r \\ \hline R \end{array}\right)$
I I	1, 1,		, ',e	(11/c 11
0 0	00	0 0	0 1.000	0 1.000
Straight line	Straight line	Straight line	Straight line	Straight line
3.300 .730	3.300 .730	3.300 .730	.450 1.000	.450 1.000
3.325 .735	3.325 .735	3 • 325 • 7355	.500 .999	.500 .999
3.350 .740	3.350 .740	3.350 .7405	.550 .998	.550 .998
3.375 .745	3.375 .745	3.375 .745	.600 .9975	600 9975
3.400 .749	3.400 .749	3.400 .750	.650 .997	.650 .997 .700 .995
3.425 .753	3.425 .753	3.425 .754 3.450 .7575	.700 .995	.700 .995 .750 .9925
3.450 .757	3.450 .757 3.475 .760	3.450 .7575 3.475 .7615	.750 .9925 .800 .990	800 .990
3.475 .760 3.500 .763	3.500 .763	3.500 .765	.850 .987	.850 .987
3.500 .763 3.525 .766	3.525 .766	3.525 .7675	.900 .984	.900 .984
3.550 .7675	3.550 .7675	3.550 .770	.950 .979	•950 •979
3.575 .769	3.575 .769	3.575 .772	1.000 .973	1.000 .973
3.600 .7705	3.600 .7705	3.600 .773	1.050 .966	1.050 .966
3.625 .772	3.625 .772	3.625 .774	Straight line	Straight line
3.650 .772	3.650 .772	3.650 .775	1.400 .920	1.700 .875
3.675 .7705	3.675 .7705	3.675 .774	1.425 .917	1.800 .862
3.700 .769	3.700 .769	3.700 .772	1.450 .915	1.900 .849
3.725 .767	3.725 .767	3.725 .768	1.475 .9125	2.000 .836
3.750 .764	3.705 .769	3.750 .765	1.500 .911	2.100 .824
Straight line	3. <b>7</b> 25 .767	Straight line	1.550 .908	2.200 .812
4.050 .716	Straight line	3.950 .730	1.600 .905	2.300 .802
Engine face	5.000 1.6230	4.050 .710	1.650 .902	2.400 .792
	5.100 .611	4.150 .690	1.700 .899	2.500 .704
	5.200 .598	4.250 .668	1.800 .893	2.600 .778
	5.300 .584	4.350 .646	1.900 .888	2.700 .775 2.800 .776
	5.400 .570	4.450 .623	2.000 .882 2.100 .876	2.800 .776 2.850 .778
	5.500 .553	4.550 .599 4.650 .574	2.100 .876 2.200 .871	2.900 .782
	5.600 .534 5.700 .513	4.650 .574 4.750 .548	2.300 .866	2.950 .790
	5.800 .488	4.850 .523	2.400 .861	3.000 .802
	5.900 .457	4.950 .498	2.500 .856	3.050 .815
	6.000 .419	5.050 .4725	2.600 .8525	3.100 .823
	6.045 .400	5.150 .447	2.700 .848	3.125 .825
	Engine face	5.250 .4235	2.800 .845	Engine face
		5.350 .404	2.900 .841	<b>9</b>
		5.375 .400	3.000 .838	
		Engine face	3.100 .835	
		•	3.200 .833	
			3.300 .830	
			3.400 .828	
			3.500 .827	
			3.600 .826	
			3.670 .825	
			Engine face	

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\overline{p}_{t_2}/p_{t_\infty}$ 

The following include total pressure recoveries from the individual tubes which were mounted at the engineface. Other quantities of interest are also included. A sketch showing the location of each tube is shown below.



Engine-face pressure tube location looking downstream

M <sub>∞</sub> =	3.2	20	_ α =	0.	0°	m <sub>o</sub>	$/m_{\infty} = .$	1.000	)	E <b>x</b> it s	etting	=	A
P <sub>tz</sub>	2/p <sub>t∞</sub> =	0.776	<u> </u>	$_{\rm ol}/{\rm m}_{\infty} =$	0.07	<u>7</u>	p <sub>t2</sub> =.	0.147	7		p <sub>2</sub> /p <sub>x</sub>	, = <u>35</u>	6.61
RAKE			TUBE	NO.			RAKE			TUBE	NO.		$\overline{}$
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.803	0.806	0.807	0.783	0 <b>.7</b> 51	0.729	2	0.809	0.809	0.805	0.799	0.764	0.732
3	0.802	0.819	0.787	0.754	0.733	0.721		l E	1	0.811			
5	0.814	0.789	0.773	0.747	0 <b>.7</b> 28	0.717	6	0	1	0.798			
M <sub>∞</sub> :	= _3.2	20	_ α =		)°	m <sub>O</sub>	/m <sub>∞</sub> = .	1.000	)	Exit	settin	g =	A
₽ <sub>t2</sub>	/p <sub>t<sub>∞</sub></sub> =	0.723	3 <u></u> mb	$_1/m_\infty$ =	0.06	<u>7</u> Δ	p <sub>t2</sub> = -	0.210	)		p <sub>2</sub> /p	∞ = <u> </u>	32.38
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.805	0.770	0.727	0.677	0.656	0.653	2	0.780	0 <b>.7</b> 55	0.731	0.701	0.676	0.665
	الماما	1	A	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		0 500	4					0.674	
3	0.744	0.764	0.776	0.756	0.730	0.703	4	0.110	10.100	0.170	0.170	· · ·   -	で・ <sup>()</sup>
	0.744 0. <b>77</b> 3							0.779					
5	0 <b>.7</b> 73	0.754	0.748	0.696	0.662	0.657	6		0.776	0 <b>.7</b> 54	0.701	0.668	0.659
5 M <sub>∞</sub> =	0 <b>.7</b> 73	0.754 0	0.748 α =	0.696 0	0.662 .0°	0.657 m <sub>o</sub>	6 /m <sub>∞</sub> =	0.779	0.776 0	0 <b>.7</b> 54	0.701 settin	0.668	0.659 A
5 M <sub>∞</sub> =	0 <b>.7</b> 73	0.754 0	0.748 α =	0.696 0 1/m <sub>∞</sub> =	0.662 .0°	0.657 m <sub>o</sub>	6 /m <sub>∞</sub> =	0.779 1.00	0.776 0	0.754 Exit	0.701 setting p <sub>2</sub> /p <sub>0</sub>	0.668 g =	0.659 A
$M_{\infty} = \bar{p}_{t_2}$	0.773 3.2 /p <sub>t<sub>∞</sub></sub> =	0.754 0 0.648	0.748 α = m <sub>b</sub>	0.696 0 1/m <sub>∞</sub> =	0.662 .0° 0.065	0.657 	6 /m <sub>∞</sub> = . p <sub>t2</sub> = .	0.779 1.00	0.776	0 <b>.7</b> 54	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO.	0.668 g =	0.659 A
5 M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.	0.773 3.2 /p <sub>t<sub>∞</sub></sub> =	0.754 0 0.648	0.748 α = m <sub>b</sub> TUBE	$0.696$ $0$ $1/m_{\infty} =$ NO.	0.662 .0° 0.065	0.657 	$6$ $m_{\infty} = \frac{1}{2}$ RAKE	0.779 1.00 0.298	0.776	O.754 Exit: TUBE	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO.	0.668 3 =2 \$\infty = _2	0.659 A 8.22
5 M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.	0.773 3.2 /p <sub>t<sub>∞</sub></sub> =	0.754 0 0.648 2 0.558	0.748 α =  mb  TUBE 3 0.559	$0.696$ $0.696$ $1/m_{\infty} = 0.565$	0.662 .0° 0.065 5 0.553	0.657 	6 /m <sub>∞</sub> = - Pt <sub>2</sub> = - RAKE NO.	0.779 1.00 0.298 1 0.626	0.776 0 2 0.671	0.754 Exit : TUBE 3 0.682	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669	0.668  8 =2  5 0.705	0.659 A 8.22 6 0.693
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	0.773 3.2 /p <sub>t</sub> = 1 0.557 0.595	0.754 0 0.648 2 0.558 0.648	0.748  \alpha = \frac{1}{2} \text{mb} \text{TUBE} \text{3} \text{0.559} \text{0.682}	$0.696$ $0.696$ $1/m_{\infty} = 0.565$	0.662 .0° 0.065 5 0.553 0.706	0.657  mo  Δ:  6  0.541  0.657	6 /m <sub>∞</sub> = _ Pt <sub>2</sub> = - RAKE NO. 2	0.779 1.00 0.298 1 0.626 0.590	0.776 0 2 0.671 0.632	0.754 Exit: TUBE 3 0.682 0.634	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635	0.668  8 =2  5 0.705 0.690	0.659 A 8.22 6 0.693 0.676
5 M <sub>∞</sub> = P̄t₂ RAKE NO. 1 3 5	0.773 3.2 /p <sub>t</sub> = 1 0.557 0.595	0.754 0 0.648 2 0.558 0.648 0.627	0.748 α = mb TUBE 3 0.559 0.682 0.658	0.696  0  1/m <sub>∞</sub> =  NO.  4  0.565  0.692  0.675	0.662 .0° 0.065 5 0.553 0.706 0.684	0.657 mo Δ: 6 0.541 0.657 0.704	6 /m <sub>∞</sub> = - RAKE NO. 2 4	0.779 1.00 0.298 1 0.626	0.776 0 2 0.671 0.632 0.673	0.754 Exit: TUBE 3 0.682 0.634	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635	0.668  8 =2  5 0.705 0.690 0.720	6 0.693 0.676 0.675
$M_{\infty} = \frac{5}{P_{t2}}$ RAKE NO. $\frac{1}{3}$ $\frac{3}{5}$	0.773 3.2 /pt <sub>\infty</sub> =  0.557 0.595 0.606	0.754 0 0.648 2 0.558 0.648 0.627	0.748 α =  TUBE  3  0.559  0.682  0.658	$0.696$ $1/m_{\infty} = 0.565$ $0.692$ $0.675$	0.662 .0° 0.065 5 0.553 0.706 0.684	0.657  mo  6  0.541  0.657  0.704  mo,	$6$ $/m_{\infty} = \frac{1}{2}$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} = \frac{1}{2}$	0.779 1.00 0.298 1 0.626 0.590 0.595	0.776 0 2 0.671 0.632 0.673	TUBE 3 0.682 0.634 0.734	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635 0.715 setting	0.668  8 =2  5 0.705 0.690 0.720	0.659 A 8.22 6 0.693 0.676 0.675 B
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	0.773 3.2 /p <sub>t</sub> <sub>∞</sub> = 1 0.557 0.595 0.606	0.754 0 0.648 2 0.558 0.648 0.627	0.748 α =  TUBE  3  0.559  0.682  0.658	0.696  \[ \begin{align*} 0.696 \] \[ \mathbf{N}\times & \text{\texit{\texi{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tinit}\\ \text{\texi{\text{\texi{\text{\text{\texi{\text{\text{\text{\text{\text{\texi{\text{\texi{\text{\texi{\texi{\texi{\texi{\texi{\texi{\texi{\texi\texi{\texi{\texi{\texi{\texi\texi{\texi{\texi{\texi{\texi{\texi{\tiin}\tint{\tiin}\	0.662 .0° 0.065 5 0.553 0.706 0.684	0.657  mo  6  0.541  0.657  0.704  mo,	$6$ $/m_{\infty} = \frac{1}{2}$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} = \frac{1}{2}$ $RAKE$	0.779 1.00 0.298 1 0.626 0.590 0.595	0.776 0 2 0.671 0.632 0.673	TUBE 3 0.682 0.634 0.734	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635 0.715 setting p <sub>2</sub> /p	0.668  s =2  5 0.705 0.690 0.720	0.659 A 8.22 6 0.693 0.676 0.675 B
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	0.773 3.2 /p <sub>t</sub> <sub>∞</sub> = 1 0.557 0.595 0.606	0.754 0 0.648 2 0.558 0.648 0.627	0.748  \alpha = \text{TUBE} 3 0.559 0.682 0.658 \alpha = \text{7} \text{mb}	0.696  \[ \begin{align*} 0.696 \] \[ \mathbf{N}\times & \text{\texit{\texi{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tinit}\\ \text{\texi{\text{\texi{\text{\text{\texi{\text{\text{\text{\text{\text{\texi{\text{\texi{\text{\texi{\texi{\texi{\texi{\texi{\texi{\texi{\texi\texi{\texi{\texi{\texi{\texi\texi{\texi{\texi{\texi{\texi{\texi{\tiin}\tint{\tiin}\	0.662 .0° 0.065 5 0.553 0.706 0.684	0.657  mo  6  0.541  0.657  0.704  mo,	$6$ $/m_{\infty} = \frac{1}{2}$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} = \frac{1}{2}$ $p_{t_{2}} = \frac{1}{2}$	0.779 1.00 0.298 1 0.626 0.590 0.595	0.776 0 2 0.671 0.632 0.673	TUBE 3 0.682 0.634 0.734 Exit	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635 0.715 setting p <sub>2</sub> /p	0.668  s =2  5 0.705 0.690 0.720	0.659 A 8.22 6 0.693 0.676 0.675 B
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	0.773 3.2 /pt <sub>\infty</sub> =  0.557 0.595 0.606  3. /pt <sub>\infty</sub> =	0.754 0 0.648 2 0.558 0.648 0.627 20	0.748 α = π TUBE 3 0.559 0.682 0.658 α = 7 π TUBE 3	0.696  1/m <sub>∞</sub> =  NO.  4  0.565  0.692  0.675  0  1/m <sub>∞</sub> =	0.662 .0° 0.065 5 0.553 0.706 0.684 .0°	0.657 m <sub>0</sub> Δ: 6 0.541 0.657 0.704  m <sub>0</sub> 9 Δ	6 /m <sub>\infty</sub> = .  RAKE NO.  2 4 6 /m <sub>\infty</sub> = .  Pt <sub>2</sub> = .  RAKE NO.	0.779 1.00 0.298 1 0.626 0.590 0.595 1.00	0.776 0 2 0.671 0.632 0.673	TUBE 3 0.682 0.634 0.734 Exit:	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635 0.715 setting p <sub>2</sub> /p NO. 4	0.668  s =2  5 0.705 0.690 0.720  s =3	6 0.693 0.693 0.676 0.675 B 5.54
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	0.773 3.2 /pt_w =  1 0.557 0.595 0.606 3. /pt_w =	0.754 0 0.648 2 0.558 0.648 0.627 20 0.77	0.748 α = TUBE 3 0.559 0.682 0.658 α = 7 TUBE 3 0.813	0.696 $1/m_{\infty} = 0$ NO. $1/m_{\infty} = 0$ $0.565$ $0.692$ $0.675$ $0$ $1/m_{\infty} = 0$ NO. $1/m_{\infty} = 0$	0.662 .0° 0.065 5 0.7553 0.706 0.684 .0° 0.066	0.657  mo Δ:  6 0.541 0.657 0.704  mo 9 Δ 6 0.728	6 /m <sub>\infty</sub> = .  RAKE NO.  2 4 6 /m <sub>\infty</sub> = .  Pt <sub>2</sub> = .  RAKE NO.	1.00 0.298 1 0.626 0.590 0.595 1.00 0.14	0.776 0 2 0.671 0.632 0.673 0 8	0.754 Exit: TUBE 3 0.682 0.634 0.734 Exit:	0.701 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.669 0.635 0.715 setting p <sub>2</sub> /p NO. 4 0.799	0.668  S =2  5 0.705 0.690 0.720  S =3  5 0.765	6 0.675 6 0.675 B 5.54 6 0.735

$M_{\infty} =$	· <u>3.</u>	20	_ a =	0	.0°	m <sub>o</sub>	$/m_{\infty} = .$	1.00	0	Exit s	etting	=	В
₱t₂	<sub>2</sub> /p <sub>t</sub> , =	0.730	m <sub>b</sub>	$_{\rm ol}/{\rm m}_{\infty}$ =	0.061	·	p <sub>t2</sub> = .	0.22	3		$p_2/p_{\infty}$	3	2.14
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.809	0.757	0.689	0.655	0.646	0.647	2	0.791	0.797	0.777	0.742	0.719	0.690
3	0.777	0.782	0 <b>.7</b> 53	0.725	0.707	0.689	4	0 <b>.7</b> 50	0.760	0.747	0.740	0.727	0.703
5	0.767	0.787	0.783	0.741	0.711	0.690	6	0.783	0.743	0.712	0.674	0.656	0.652
$\mathrm{M}_{\infty}$	= 3.2	0	_ α =	0	.0°	m <sub>O</sub>	$m_{\infty} = 1$	1.000		Exit	settin	3 =	В
₱ <sub>t₂</sub>	$p_{t_{\infty}} =$	0.634	m <sub>b</sub>	$_1/m_\infty =$	0.06	<u>0</u>	p <sub>t2</sub> = -	0.302			p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = _26	5.30
RAKE			TUBE	NO.			RAKĘ			TUBE	NO.		
NO.	1	2	3	4	_ 5	6	NO.	1	2	3	4	5	6
1	0.645	0.605	0.570	0.565	0.558	0.558	2	0.582	0.549	0.531	0.524	0.521	0.521
3	0.642	0.665	0.693	0.690	0.694	0.678	14	I			0.656		
5	0.614	0.641	0.648	0.657	0.680	0.678	6	0.690	0.694	0.702	0.688	0.691	0.680
M <sub>m</sub> =	_ 3.	20	~ -	0	0°	•	,		_				
		20	$\alpha =$	. 0	•0	mO	$/m_{\infty} =$	1.000	0	Exit:	settine	<b>z</b> ==	C
						_						3 =	_
						_						s = ∞ = _3:	_
₽t;			m <sub>b</sub>	$_1/m_\infty =$		_	p <sub>t2</sub> = -				p <sub>2</sub> /p <sub>0</sub>		-
	<sub>2</sub> /p <sub>t<sub>∞</sub></sub> =	: <u>0.77</u> 0	<sup>m</sup> b TUBE		0.06	<u>1</u>	p <sub>t2</sub> = _		1	TUBE	p <sub>2</sub> /p <sub>0</sub>	∞ <del>=</del> 35	5.18
$ar{p}_{ ext{t}}$	p <sub>t</sub> =	2	TUBE	$1/m_{\infty} =$ NO.	<b>0.</b> 06	<u>1</u>	P <sub>t2</sub> = . RAKE NO.	0.15	2	TUBE	p <sub>2</sub> /p <sub>0</sub>	x <u>35</u>	6
RAKE	pt <sub>w</sub> =	2 0.808	TUBE 3 0.787	$1/m_{\infty} = \frac{1}{1}$ NO. 4 0.748	<b>0.</b> 06	1 A	Pt2 = RAKE	0.15	2 0.804	TUBE 3 0.796	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794	<sub>∞</sub> = _35	6 0.731
RAKE NO.	1 0.800 0.811	2 0.808 0.821	TUBE 3 0.787 0.781	$1/m_{\infty} = 0.748$	0.06 5 0.717 0.718	6 0.709 0.712	Pt2 = - RAKE NO. 2	0.15 1 0.802 0.767	2 0.804 0.795	TUBE 3 0.796 0.815	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794 0.794	5 0.763 0.772	6 0.731 0.739
RAKE NO.	1 0.800 0.811	2 0.808 0.821 0.785	TUBE 3 0.787 0.781 0.774	$1/m_{\infty} =$ NO. 4 0.748 0.744 0.756	5 0.717 0.718 0.731	6 0.709 0.712 0.717	Pt <sub>2</sub> = - RAKE NO.  2 4 6	0.15 1 0.802 0.767	2 0.804 0.795 0.826	TUBE 3 0.796 0.815 0.780	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794	5 0.763 0.772 0.724	6 0.731 0.739 0.716
RAKE NO.  1  3 $5$	1 0.800 0.811 0.798	2 0.808 0.821 0.785	TUBE 3 0.787 0.781 0.774 α =	$1/m_{\infty} =$ NO. 4 0.748 0.744 0.756	5 0.717 0.718 0.731	6 0.709 0.712 0.717	$Pt_{2} = -\frac{1}{2}$ RAKE NO. $2$ $4$ $6$ $/m_{\infty} = -\frac{1}{2}$	0.15 1 0.802 0.767 0.821	2 0.804 0.795 0.826	TUBE 3 0.796 0.815 0.780	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794 0.794 0.748 setting	5 0.763 0.772 0.724	6 0.731 0.739 0.716
RAKE NO.  1 3 5  M <sub>∞</sub> =	1 0.800 0.811 0.798 = 3.	2 0.808 0.821 0.785	TUBE 3 0.787 0.781 0.774 α =	$1/m_{\infty} =$ NO. 4 0.748 0.744 0.756 0	5 0.717 0.718 0.731	6 0.709 0.712 0.717	$Pt_{2} = -$ RAKE NO. $2$ $4$ $6$ $/m_{\infty} = $ $Pt_{2} = -$	0.15 1 0.802 0.767 0.821	2 0.804 0.795 0.826	TUBE 3 0.796 0.815 0.780	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794 0.794 0.748 settin	5 0.763 0.772 0.724	6 0.731 0.739 0.716
RAKE NO.  1  3 $5$	1 0.800 0.811 0.798 = 3.	2 0.808 0.821 0.785	TUBE 3 0.787 0.781 0.774 α =	$1/m_{\infty} =$ NO. 4 0.748 0.744 0.756 0	5 0.717 0.718 0.731	6 0.709 0.712 0.717	$Pt_{2} = -\frac{1}{2}$ RAKE NO. $2$ $4$ $6$ $/m_{\infty} = -\frac{1}{2}$	0.15 1 0.802 0.767 0.821	2 0.804 0.795 0.826	TUBE 3 0.796 0.815 0.780 Exit	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794 0.794 0.748 settin	5 0.763 0.772 0.724	6 0.731 0.739 0.716
RAKE NO.  1  3  5 $M_{\infty}$ RAKE NO.	1   0.800   0.811   0.798   = 3.	2 0.808 0.821 0.785 20 0.73	TUBE 3 0.787 0.781 0.774 α = 0 mb	$1/m_{\infty} =$ NO.  4  0.748  0.744  0.756  0  1/ $m_{\infty} =$ NO.  4	5 0.717 0.718 0.731 .0°	1 Δ 6 0.709 0.712 0.717	$\begin{array}{c} P_{t_2} = -\\ RAKE\\ NO. \end{array}$ $\begin{array}{c} 2\\ 4\\ 6\\ \end{array}$ $m_{\infty} = \\ P_{t_2} = -\\ RAKE\\ NO. \end{array}$	0.15 1 0.802 0.767 0.821 1.000 0.186	2 0.804 0.795 0.826	TUBE 3 0.796 0.815 0.780 Exit	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.794 0.794 0.748 setting	5 0.763 0.772 0.724 8 =	6 0.731 0.739 0.716 C
RAKE NO.  1 3 5 $M_{\infty}$ $\bar{p}_{t}$	1   0.800   0.811   0.798   = 3.	2 0.808 0.821 0.785 20 0.73	TUBE 3 0.787 0.781 0.774 α = 0 mb TUBE 3 0.780	$1/m_{\infty} =$ NO. 4 0.748 0.744 0.756  0 1/ $m_{\infty} =$ NO. 4 0.760	5 0.717 0.718 0.731 .0° 0.05	1 Δ 6 0.709 0.712 0.717	$\begin{array}{c} p_{t_2} = -\\ RAKE \\ NO. \\ 2 \\ 4 \\ 6 \\ \\ /m_{\infty} = \\ \\ p_{t_2} = -\\ \\ RAKE \\ NO. \\ \\ 2 \\ \end{array}$	0.15 1 0.802 0.767 0.821 1.000 0.186	2 0.804 0.795 0.826 0 6	TUBE 3 0.796 0.815 0.780 Exit TUBE 3 0.747	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.794 0.794 0.748 setting	5 0.763 0.772 0.724 8 = 5 0.666	6 0.731 0.739 0.716 C 33.58

$\rm M_{\infty}$ =	3.2	20	_ a =		).0°	m <sub>o</sub>	$/m_{\infty} = 1$	1.000	)	Exit s	etting	=	C
P̄t2		0.642	<u>2</u> m <sub>b</sub>	.1/m <sub>∞</sub> =	0.05	<u>5</u> Δ	p <sub>t2</sub> = -	0.302	2		$p_2/p_{\infty}$	= 26	5.70
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.657	0.609	0.577	0.564	0.549	0.547	2	0.589	0.544	0.532	0.528	0.528	0.528
_3_	0.716	0.715	0.691	0.709	0.722	0.684	4	0.609	0.621	0.649	0.675	0.715	0.709
5	0.638	0.656	0.678	0.680	0.674	0.665	6	0.704	0.704	0.700	0.691	0.690	0.678
M <sub>∞</sub> :	= _ 3.0	00	_ a =	= 0.	.0°	m <sub>O</sub>	$/m_{\infty} = 1$	0.999	)	Exit	settin	3 =	A
$\bar{p}_{t_2}$	$p_{t_{\infty}} =$	0.915	m <sub>b</sub>	$_1/m_\infty$ =	0.12	<u>9</u>	p <sub>t2</sub> = _	0.060	<u> </u>		p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>3</u> 2	2.18
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2		4	5	6
1	0.898	0.910	0.910	0.911	0.902	0.911	2	0.896	0.916	0.898	0.916	0.944	0.940
3	0.927	0.930	0.932	0.914	0.927	0.909	4	0.888	0.898	0.896	0.919	0.930	0.936
				)									
	0.915	0.909	0.917	0.916	0.917	0.901	6	0.934	0.927	0.927	0.909	0.930	0.894
5						·							
5 M <sub>∞</sub> =	3.0	00	_ α =	. 0.	.0°	m <sub>O</sub>	/m <sub>∞</sub> =	0.99	99	Exit	setting	3 =	A
5 M <sub>∞</sub> =		00	_ α =	. 0.	.0°	m <sub>O</sub>	/m <sub>∞</sub> =	0.99	99	Exit	setting	3 =	A
5  M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE	= <u>3.0</u>	0.878	α = 3 m <sub>b</sub> TUBE	$m_{\infty} = 0$ .  NO.	0° 0.092	т <sub>о</sub>	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$	0.99	99	Exit	p <sub>2</sub> /p <sub>c</sub>	3 =	A
$M_{\infty} = \bar{p}_{t_2}$	3.0	0.878	α = 3 m <sub>b</sub> TUBE	$\frac{1}{m_{\infty}} =$	0° 0.092	т <sub>о</sub>	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$	0.99	99	Exit	p <sub>2</sub> /p <sub>c</sub>	3 =	A -•59
5  M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE	= 3.0 /p <sub>t<sub>w</sub></sub> =	0.878	α = 3 m <sub>b</sub> TUBE	$m_{\infty} = 0$ .  NO.	0.092 5	m <sub>o</sub> 2 △	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE	0.99	99	Exit:	setting $p_2/p_0$	3 = ∞ = _3]	A -•59
5  M <sub>∞</sub> =  P t <sub>2</sub> RAKE NO.  1	= 3.0 /p <sub>t<sub>w</sub></sub> =	0.878 2 0.863	α = 3 m <sub>b</sub> TUBE 3 0.854	$m_{\infty} = 0.0$ No. 4 0.868	0.092 5 0.872	m <sub>o</sub> 2 △ 6 0.866	$m_{\infty} = 1$ $p_{t_2} = 1$ RAKE NO.	0.99	2	TUBE 3 0.858	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.877	5 0.894	A -•59 6 0•905
5  M <sub>∞</sub> =  P t <sub>2</sub> RAKE NO.  1	= 3.0 /p <sub>t</sub> = 1 0.853 0.897	2 0.863 0.894	α = 3 m <sub>b</sub> TUBE 3 0.854 0.897	$m_{\infty} = 0.0$ No. 4 0.868	0° 0.092 5 0.872 0.896	m <sub>o</sub> 2 △ 6 0.866 0.873	$/m_{\infty} = \frac{1}{2}$ $P_{t_2} = \frac{1}{2}$ $RAKE$ $NO.$ $2$	0.99	2 0.879 0.866	TUBE 3 0.858	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.877	3 =31	A59 6 0.905 0.908
5  M <sub>∞</sub> =   Pt <sub>2</sub> RAKE  NO.  1  3  5	= 3.0 /p <sub>t</sub> = 1 0.853 0.897	2 0.863 0.894 0.867	α = 3 m <sub>b</sub> TUBE 3 0.854 0.897 0.866	$m_{\infty} = 0.$ $m_{$	0.092 5 0.872 0.896 0.873	6 0.866 0.873 0.858	$/m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4	0.99 0.069 1 0.859 0.847	2 0.879 0.866 0.896	TUBE 3 0.858 0.858 0.904	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.877	5 0.894 0.899 0.908	A 59 6 0.905 0.908 0.874
5  M <sub>∞</sub> =   P t <sub>2</sub> RAKE NO.  1 3 5  M <sub>∞</sub> =	1 0.853 0.873	0.878 2 0.863 0.894 0.867	α = 3 m <sub>b</sub> TUBE 3 0.854 0.897 0.866	$m_{\infty} = 0.0$	0.092 5 0.872 0.896 0.873	6 0.866 0.873 0.858	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ $2$ $4$ $6$ $/m_{\infty} =$	0.99 0.069 1 0.859 0.847 0.902	2 0.879 0.866 0.896	TUBE 3 0.858 0.858 0.904	P <sub>2</sub> /P <sub>6</sub> NO. 4 0.877 0.881 0.888 setting	5 0.894 0.899 0.908	A59 6 0.905 0.908 0.874 A
$5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE NO. $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE	= 3.0 p <sub>t</sub> <sub>w</sub> = 1 0.853 0.897 0.873 = 3.0	0.878 2 0.863 0.894 0.867	α = 3 m <sub>b</sub> TUBE 3 0.854 0.897 0.866	$\begin{array}{c} \cdot & \cdot \\ 1/m_{\infty} = \\ \cdot & \cdot \\ \cdot &$	0.092 5 0.872 0.896 0.873	6 0.866 0.873 0.858	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$	0.99 0.069 1 0.859 0.847 0.902	2 0.879 0.866 0.896	TUBE 3 0.858 0.858 0.904	setting $p_2/p_0$ NO. 4 0.877 0.881 0.888 setting $p_2/p_0$	5 0.894 0.899 0.908	A59 6 0.905 0.908 0.874 A
5  M <sub>\infty</sub> =  \bar{p}t_2  RAKE NO.  1  3  5  M <sub>\infty</sub> =  \bar{p}t_2	= 3.0 p <sub>t</sub> <sub>w</sub> = 1 0.853 0.897 0.873 = 3.0	0.878 2 0.863 0.894 0.867	α = 3 mb TUBE 3 0.854 0.866 α =	$\begin{array}{c} \cdot & \cdot \\ 1/m_{\infty} = \\ \cdot & \cdot \\ \cdot &$	0.092 5 0.872 0.896 0.873	6 0.866 0.873 0.858	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ . $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_2} =$	0.99 0.069 1 0.859 0.847 0.902	2 0.879 0.866 0.896	TUBE 3 0.858 0.858 0.904 Exit	setting $p_2/p_0$ NO. 4 0.877 0.881 0.888 setting $p_2/p_0$	5 0.894 0.899 0.908	A59 6 0.905 0.908 0.874 A
$5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE NO. $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE	= 3.0 $p_{t_{\infty}}$ = 1 0.853 0.897 0.873 = 3.0 $p_{t_{\infty}}$ = 1	2 0.863 0.894 0.867 00	α = 3 mb TUBE 3 0.854 0.897 0.866 α = mb TUBE 3	$m_{\infty} = 0.0$	5 0.872 0.896 0.873	6 0.866 0.873 0.858 mo	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$	0.99 0.069 1 0.859 0.847 0.902 0.999 0.110	2 0.879 0.866 0.896	TUBE 3 0.858 0.858 0.904 Exit:	setting $p_2/p_0$ NO.  4 0.877 0.881 0.888 setting $p_2/p$ NO.	5 0.894 0.899 0.908	A59 6 0.905 0.908 0.874 A 27.70
5  M <sub>∞</sub> = $\bar{P}_{t_2}$ RAKE NO.  1  3  5  M <sub>∞</sub> = $\bar{P}_{t_2}$	1 0.853 0.897 0.873 = 3.0 2/Pt_ =	2 0.863 0.894 0.867 00 0.806	α = 3 mb TUBE 3 0.854 0.897 0.866 α =  mb TUBE 3 0.765	$\begin{array}{c} \cdot & \cdot \\ \cdot \\ 1/m_{\infty} = \\ \cdot \\$	0.092 5 0.872 0.896 0.873 0° 0.0°	m <sub>o</sub> 6  0.866  0.873  0.858  m <sub>o</sub> 77  Δ	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.	0.99 0.069 1 0.859 0.847 0.902 0.999 0.110	2 0.879 0.866 0.896	TUBE 3 0.858 0.858 0.904 Exit TUBE 3 0.764	setting $p_2/p_0$ NO.  4 0.877 0.881 0.888 setting $p_2/p$ NO.  4	5 0.894 0.899 0.908 3 =2	A  6  0.905  0.908  0.874  A  27.70  6  0.823

$M_{\infty} =$	3.0	00	<u>α</u> =		).0°	m <sub>o</sub>	$/\mathrm{m}_{\infty}$ = .	0.999	)	Exit s	etting	=	В
₱ <sub>t₂</sub>	<sub>2</sub> /p <sub>t∞</sub> =	0.910	<u> </u>	$_{1}/m_{\infty} =$	0.109	<u> </u>	Pt2 =_	0.06	52		p <sub>2</sub> /p <sub>∞</sub>	<b>=</b> <u>31</u>	.76
RAKE			TUBE	NO.		•	RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.903	0.910	0.915	0.905	0.896	0.901	2	0.892	0.909	0.892	0.922	0.936	0.932
3	0.928	0.921	0.927	0.909	0.926	0.902	14	0.884	0.892	0.888	0.910	0.916	0.915
5	0.916	0.911	0.918	0.906	0.905	0.885	6	0.931	0.921	0.920	0.902	0.918	0.880
M <sub>∞</sub> :	= _3.0	00	_ α =	:	).0°	m <sub>O</sub> ,	/m <sub>∞</sub> = _	0.999	)	Exit	settin	3 =	В
Pt2	/p <sub>t<sub>∞</sub></sub> =	0.88	<u> </u>	$_1/m_\infty =$	0.086	<u> </u>	p <sub>t2</sub> = -	0.087	<del></del>		p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>30</u>	0.71
RAKE		·	TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.874	0.874	0.867	0.873	0.868	0.864	2	0.868	0.884	0.865	0.890	0.900	0.909
_3	<del>                                     </del>			0.874		<u> </u>	14	0.860	0.878	0.865	0.894	0.901	0.899
	001	0-0	001	- 0			1	H	'				
5	0.894	0.879	0.884	0.870	0.870	0.844	6	0.921	0.909	0.906	ಂ.888	0.908	0.881
		·					L	·			0.888 setting		
M <sub>∞</sub> =	3.0	00	_ α =	:C	).0°	m <sub>O</sub>	$/m_{\infty} = 1$	0.999	)		setting	g =	В
M <sub>∞</sub> =	3.0	00	_ α =	:C	).0°	m <sub>O</sub>	/m <sub>∞</sub> =	·	)		setting		В
M <sub>∞</sub> =	= 3.0 /p <sub>t</sub> =	0.81 <sup>1</sup>	α =  + m <sub>b</sub> TUBE	$1/m_{\infty} =$	0.07	m <sub>o</sub>	/m <sub>∞</sub> =	0.999	)		p <sub>2</sub> /p <sub>c</sub>	g =	В
M <sub>∞</sub> =	3.0	0.81 <sup>1</sup>	α =  + m <sub>b</sub>	$1/m_{\infty} =$	0.07	m <sub>o</sub>	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE	0.999	3	Exit s	p <sub>2</sub> /p <sub>c</sub>	z =	В
$M_{\infty} = \bar{p}_{t_2}$	= 3.0 /p <sub>t<sub>∞</sub></sub> =	0.81 <sup>1</sup>	α = + m <sub>b</sub> TUBE	$1/m_{\infty} =$	0.0° 0.07] 5	m <sub>O</sub> Δ:	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE NO.	0.999	2	Exit s	p <sub>2</sub> /p <sub>e</sub>	3 = ∞ =2	B 27.87
$M_{\infty} = \overline{p}_{t_2}$ RAKE	= 3.0 /p <sub>t</sub> <sub>∞</sub> = 1 0.842	0.81 <sup>1</sup> 2 0.796	α =  + m <sub>b</sub> TUBE  3  0.780	$\frac{1}{m_{\infty}} = \frac{1}{m_{\infty}}$ NO.	0.0° 0.07] 5 0.806	m <sub>o</sub> L∆: 6 0.799	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.999	2	TUBE 3 0.777	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.809	5 0.863	B 7.87 6 0.819
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1 0.842 0.865	2 0.81 <sup>1</sup> 2 0.796 0.820	α =  + mb  TUBE  3 0.780 0.811	$\frac{1}{m_{\infty}} = \frac{1}{m_{\infty}}$ NO. $\frac{1}{4}$ 0.793	0.07 0.07 5 0.806 0.826	6 0.799 0.805	$/m_{\infty} = \frac{1}{2}$ RAKE NO.	0.999 0.108 1 0.818 0.811	2 0.809 0.826	TUBE 3 0.777	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.809	5 0.863 0.827	B 6 0.819 0.842
$M_{\infty} = \overline{P}_{tz}$ RAKE NO.  1  3	1 0.842 0.865	2 0.81 <sup>1</sup> 2 0.796 0.820 0.808	α =  + mb  TUBE  3  0.780  0.811  0.793	$1/m_{\infty} = \frac{1}{1}$ NO. 4 0.793 0.806	0.07 0.07 5 0.806 0.826 0.785	6 0.799 0.805	$/m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.999 0.108 1 0.818 0.811	2 0.809 0.826 0.824	TUBE 3 0.777 0.784 0.832	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.809 0.799	5 0.863 0.827 0.827	6 0.819 0.833
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5	1 0.842 0.865 0.848	2 0.796 0.820 0.808	α =  + mb  TUBE  3 0.780 0.811 0.793	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO. 4 0.793 0.806 0.793	0.0°  0.073  5  0.806  0.826  0.785	6 0.799 0.805 0.779	$/m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $\frac{1}{6}$	0.999 0.108 1 0.818 0.811 0.856	2 0.809 0.826 0.824	TUBE 3 0.777 0.784 0.832	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.809 0.799 0.810	5 0.863 0.827 0.827	B 6 0.819 0.842 0.833
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{tz}$	1 0.842 0.865 0.848	2 0.796 0.820 0.808	α =  + mb  TUBE  3 0.780 0.811 0.793	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO. 4 0.793 0.806 0.793 0. $1/m_{\infty} = \frac{1}{m_{\infty}}$	0.0°  0.073  5  0.806  0.826  0.785	6 0.799 0.805 0.779	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE	0.999 0.108 1 0.818 0.811 0.856	2 0.809 0.826 0.824	TUBE 3 0.777 0.784 0.832	setting $p_2/p_0$ NO. 4 0.809 0.799 0.810 setting $p_2/p_0$	5 0.863 0.827 0.827	B 6 0.819 0.842 0.833
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{tz}$	1 0.842 0.865 0.848	2 0.796 0.820 0.808	α =  + mb  TUBE 3 0.780 0.811 0.793  α = 2 mb	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO. 4 0.793 0.806 0.793 0. $1/m_{\infty} = \frac{1}{m_{\infty}}$	0.0°  0.073  5  0.806  0.826  0.785	6 0.799 0.805 0.779	$/m_{\infty} = \frac{1}{2}$ RAKE NO. $2$ $4$ $6$ $/m_{\infty} = \frac{1}{2}$	0.999 0.108 1 0.818 0.811 0.856	2 0.809 0.826 0.824	TUBE 3 0.777 0.784 0.832 Exit	setting $p_2/p_0$ NO. 4 0.809 0.799 0.810 setting $p_2/p_0$	5 0.863 0.827 0.827	B 6 0.819 0.842 0.833
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{tz}$	1 0.842 0.865 0.848 = 3.0	2 0.796 0.820 0.808	α =  + mb  TUBE  3  0.780  0.811  0.793  α =  2 mb  TUBE  3	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4  0.793  0.806  0.793  0. $1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.	5 0.806 0.826 0.785 0° 0.098	6 0.799 0.805 0.779 mo.	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE	0.999 0.108 1 0.818 0.811 0.856 0.999 0.068	2 0.809 0.826 0.824	TUBE 3 0.777 0.784 0.832 Exit	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.809 0.799 0.810 setting P <sub>2</sub> /P	5 0.863 0.827 0.827 3 =3	6 0.819 0.842 0.833 C
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1 0.842 0.865 0.848 = 3.0 2 / Pt_ = 1 0.896 0.924	2 0.796 0.820 0.808 0.902 2 0.902	α =  TUBE  3  0.780  0.811  0.793  α =  100  TUBE  3  0.904  0.921	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4  0.793  0.806  0.793  0. $1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4	0.0°  0.073  5  0.806  0.785  0.098  5  0.885  0.913	m <sub>0</sub> 6 0.799 0.805 0.779 m <sub>0</sub> Δ 6 0.892 0.890	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  4	0.999 0.108 1 0.818 0.811 0.856 0.999 0.068	2 0.809 0.824 0.824 2 0.902 0.888	TUBE 3 0.777 0.784 0.832 Exit TUBE 3 0.889 0.881	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.809 0.799 0.810 setting p <sub>2</sub> /p NO. 4 0.920 0.903	5 0.863 0.827 0.827 3 =3 5 0.934 0.911	6 0.819 0.842 0.833 c 1.43

$M_{\infty} =$	3.0	00	<u></u> α =		0.0°	_ m <sub>o</sub>	$/m_{\infty} = .$	0.999	)	Exit s	etting	=	С
₱ <sub>t2</sub>	<sub>2</sub> /p <sub>t<sub>∞</sub></sub> =	0.890	<u> </u>	$_{\rm ol}/{\rm m}_{\infty}$ =	0.082	2_ △	p <sub>t2</sub> = _	0.091	<del> </del>		$p_2/p_{\infty}$	= <u>3</u>	80.87
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.887	0.884	0.877	0.874	0.865	0.858	2	0.879	0.894	0.873	0.900	0.908	0.903
3	0.923	0.906	0.904	0.879	0.900	0.876	4	0.870	0.885	0.879	0.899	0.902	0.887
5	0.904	0.887	0.893	0.874	0.868	0.849	6	0.933	0.920	0.910	0.887	0.906	0.875
M <sub>∞</sub> :	= 3.0	00	<u></u> α =	·	0.0°	m <sub>O</sub>	$m_{\infty} = 1$	0.999	9	Exit	settin	z =	С
₽ <sub>t2</sub>	$/p_{t_{\infty}} =$	0.820	o <sup>m</sup> o	$_1/m_\infty$ =	0.06	<u>5</u> <u>\( \( \) \( \) \( \) \( \)</u>	p <sub>t2</sub> = -	0.108	3		p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = _28	3.11
RAKE			TUBE				RAKE	U		TUBE	NO.		
NO.	1	2	3	4	_5	6	NO.	1	2	3	4	5	6
1	0.857	0.804	0.789	0.797	0.807	0.802	2	0.827	0.817	0.785	0.813	0.857	0.834
			010	0 800	0.832	0.811	14	0.821	0.835	0.791	0.803	0.826	0.848
3	0.874	0.824	0.012	0.009	0.002			i		1 '-	_	i i	
	0.874 0.858							0.867					
5	0.858	0.814	0 <b>.7</b> 94	0.795	0.793	0.790	6	* — ·	0.829	0.832	0.816	0.828	0.843
5 M <sub>∞</sub> =	0.858 2.	0.814 75	0.794 α =	0 <b>.7</b> 95	0.793 ).0°	0.790 m <sub>o</sub>	6 /m <sub>∞</sub> =	0.867	0.829 }	0.832 Exit	0.816	0.828	0.843 A
$M_{\infty} = \bar{p}_{t_2}$	0.858 2.	0.814 75	0.79 <sup>4</sup> α =	0.795 : (	0.793 ).0°	0.790 m <sub>o</sub>	$6$ $/m_{\infty} = $ $p_{t_2} = $	0.867 0.938	0.829 }	0.832 Exit	0.816 setting p <sub>2</sub> /p <sub>0</sub>	0.828	0.843 A
5 M <sub>∞</sub> =	0.858 2.7 Pt <sub>w</sub> =	0.814 75 	0.794 α = 4 m <sub>b</sub>	0.795 : (	0.793 ).0° 	0.790 mo 3	6 /m <sub>∞</sub> =	0.867 0.938	0.829	0.832 Exit:	0.816 setting p <sub>2</sub> /p <sub>0</sub>	0.828 3 =	0.843 A
5  M <sub>w</sub> = $\bar{p}_{t_2}$ RAKE	0.858 = 2.7 /pt <sub>w</sub> =	0.814 75 0.91 <sup>1</sup>	α =  4	$0.795$ $1/m_{\infty} =$ NO.	0.793 0.0° 0.133	0.790 m <sub>0</sub> 3 Δ:	$6$ $/m_{\infty} =$ $p_{t_2} = -$ $RAKE$ $NO.$	0.867	0.829	0.832 Exit:	0.816 setting p <sub>2</sub> /p <sub>0</sub> NO.	0.828 3 =	A59
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.	0.858 = 2.7 2/p <sub>t</sub> = 1 0.936	0.814 75 0.91 <sup>1</sup> 2 0.901	0.794 α =  + mb  TUBE 3 0.922	$0.795$ $1/m_{\infty} =$ $NO.$	0.793 0.0° 0.133 5 0.926	0.790 mo 3	$6$ $/m_{\infty} =$ $p_{t_2} = -$ $RAKE$ $NO.$	0.867	0.829	0.832 Exit: TUBE 3 0.915	0.816 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.937	0.828 3 =2] 5 0.924	0.843 A .59 6 0.881
5  M <sub>∞</sub> =    p t <sub>2</sub> RAKE NO.  1 3	0.858 = 2.7 2/p <sub>t</sub> = 1 0.936	0.814 75 0.91 <sup>1</sup> 2 0.901 0.938	0.794 α =  4 mb TUBE 3 0.922 0.918	$0.795$ $1/m_{\infty} = 0.907$ $0.898$	0.793 0.0° 0.133 5 0.926 0.923	0.790 mo 3	$6$ $/m_{\infty} =$ $p_{t_{2}} = -$ $RAKE$ $NO.$ $2$ $4$	0.867	0.829 3 ) 2 0.932 0.915	0.832 Exit: TUBE 3 0.915 0.909	0.816 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.937 0.906	0.828 3 =21 5	0.843 A 59 6 0.881 0.927
5 M <sub>∞</sub> = P̄t₂ RAKE NO. 1 3 5	0.858 2.7 pt <sub>w</sub> = 1 0.936 0.957	0.814 75 0.91 <sup>1</sup> 2 0.901 0.938 0.910	0.794 α = 4 mb TUBE 3 0.922 0.918 0.933	$0.795$ $1/m_{\infty} =$ $1/m_{\infty} $	0.793 0.0° 0.133 5 0.926 0.923 0.900	0.790  mo  A  6  0.875  0.879	$6$ $/m_{\infty} =$ $p_{t_2} = -$ $RAKE$ $NO.$ $2$ $4$ $6$	0.867 0.938 0.110 1 0.912 0.901	0.829 3 2 0.932 0.915 0.935	TUBE 3 0.915 0.909 0.920	0.816 setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.937 0.906	0.828  3 =21  5	0.843 A 59 6 0.881 0.927
$M_{\infty} = \frac{1}{p_{t_2}}$ RAKE NO. $M_{\infty} = \frac{1}{3}$ $M_{\infty} = \frac{1}{3}$	0.858 2.7 Pt <sub>w</sub> = 1 0.936 0.957 0.942	0.814 75 0.91 <sup>1</sup> 2 0.901 0.938 0.910	0.794 α = 4	0.795    /m_\infty =	0.793 0.0° 0.133 5 0.926 0.923 0.900	0.790  mo 3 △ 6 0.875 0.857 0.879	$6$ $/m_{\infty} =$ $p_{t_{2}} = -$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} =$	0.867 0.938 0.110 1 0.912 0.901 0.954	0.829 3 2 0.932 0.915 0.935	TUBE 3 0.915 0.909 0.920	0.816  setting p <sub>2</sub> /p <sub>0</sub> NO. 4 0.937 0.906 0.912 setting	0.828  3 =21  5	0.843 A .59 6 0.881 0.927 0.857
$M_{\infty} = \frac{1}{p_{t_2}}$ RAKE NO. $M_{\infty} = \frac{1}{3}$ $M_{\infty} = \frac{1}{3}$	0.858 2.7 Pt <sub>w</sub> = 1 0.936 0.957 0.942	0.814 75 0.91 <sup>1</sup> 2 0.901 0.938 0.910	0.794 α = 4	$0.795$ $1/m_{\infty} = 0.795$ $0.795$ $0.795$ $0.895$ $0.891$ $0.891$	0.793 0.0° 0.133 5 0.926 0.923 0.900	0.790  mo 3 △ 6 0.875 0.857 0.879	$6$ $/m_{\infty} =$ $p_{t_{2}} = -$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} =$	0.867 0.938 0.110 1 0.912 0.901 0.954 0.938	0.829 3 2 0.932 0.915 0.935	TUBE 3 0.915 0.909 0.920	0.816  p <sub>2</sub> /p <sub>0</sub> NO.  4  0.937  0.906  0.912  setting p <sub>2</sub> /p	0.828  3 =21  5 0.924 0.916 0.925	0.843 A .59 6 0.881 0.927 0.857
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3 $\overline{p}_{t_2}$	0.858 2.7 Pt <sub>w</sub> = 1 0.936 0.957 0.942	0.814 75 0.91 <sup>1</sup> 2 0.901 0.938 0.910	0.794  α =  4 mb  TUBE  3  0.922  0.918  0.933  α =  4 mb	$0.795$ $1/m_{\infty} = 0.795$ $0.795$ $0.795$ $0.895$ $0.891$ $0.891$	0.793 0.0° 0.133 5 0.926 0.923 0.900	0.790  mo 3 △ 6 0.875 0.857 0.879	$6$ $/m_{\infty} =$ $p_{t_{2}} = -$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_{2}} = -$	0.867 0.938 0.110 1 0.912 0.901 0.954 0.938	0.829 3 2 0.932 0.915 0.935	TUBE 3 0.915 0.909 0.920 Exit	0.816  p <sub>2</sub> /p <sub>0</sub> NO.  4  0.937  0.906  0.912  setting p <sub>2</sub> /p	0.828  3 =21  5 0.924 0.916 0.925	0.843 A .59 6 0.881 0.927 0.857
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{tz}$ RAKE	0.858 2.7 pt <sub>w</sub> = 0.936 0.957 0.942 2.7 pt <sub>w</sub> =	0.814 75 0.91 <sup>1</sup> 2 0.901 0.938 0.910 75 0.90 <sup>1</sup> 2	0.794 α = 4	0.795  1/ $m_{\infty} = 0.795$ NO.  4  0.907  0.898  0.891	0.793 0.0° 0.133 5 0.926 0.923 0.900 0.119	0.790 mo 3 Δ: 6 0.875 0.857 0.879	$6$ $/m_{\infty} =$ $p_{t_{2}} = -$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_{2}} = -$ $RAKE$	0.867 0.938 0.110 1 0.912 0.901 0.954 0.938	0.829 3 3 0.932 0.935 0.935	TUBE 3 0.915 0.909 0.920 Exit	0.816  p <sub>2</sub> /p <sub>0</sub> NO.  4  0.937  0.906  0.912  setting p <sub>2</sub> /p  NO.  4	0.828  3 =21  5	0.843 A .59 6 0.881 0.927 0.857 A
M <sub>∞</sub> = $\bar{p}_{tz}$ RAKE NO.  1  3  5  M <sub>∞</sub> = $\bar{p}_{tz}$ RAKE NO.	0.858 2.7 pt <sub>w</sub> = 1 0.936 0.957 0.942 2.7 pt <sub>w</sub> = 1 0.921	0.814 75 0.91 2 0.901 0.938 0.910 75 0.90 2 0.887	0.794 α = 4	0.795  1/ $m_{\infty} =$ NO. 4  0.907  0.898  0.891  0.1/ $m_{\infty} =$ NO. 4	0.793 0.0° 0.133 5 0.926 0.923 0.900 0.119	0.790  mo 3 Δ: 6 0.875 0.879  mo Δ 6 0.882	$6$ $/m_{\infty} =$ $pt_{2} = -$ $RAKE$ $NO.$ $2$ $4$ $6$ $/m_{\infty} =$ $pt_{2} = -$ $RAKE$ $NO.$	0.867 0.938 0.110 1 0.912 0.901 0.954 0.081	0.829 3 2 0.932 0.935 0.935 3 2 0.916	TUBE 3 0.915 0.909 0.920 Exit TUBE	0.816  p <sub>2</sub> /p <sub>0</sub> NO.  4  0.937  0.906  0.912  setting p <sub>2</sub> /p  NO.  4  0.914	0.828  3 =21  5	6 0.843 6 0.881 0.927 0.857 A 21.42

$M_{\infty} =$	2.75	<del>,</del>	_ a =	0.0	o 	m <sub>o</sub> .	$/m_{\infty} = .$	0.938	3	Exit s	etting	<b>_</b> A	
P <sub>tz</sub>	p <sub>t</sub> =	0.855	<u> </u>	.1/m <sub>∞</sub> =	0.09	<u>7</u> Δ	p <sub>t2</sub> = -	0.105	<u> </u>		p <sub>2</sub> /p <sub>∞</sub>	, = <u>1</u> 9	9.97
RAKE			TUBE	NO.			RAKE			TUBE	NO.		$\overline{}$
NO.	1	2	3		5	6	NO.	1	2	3		5	6
1	0.889	0.838	0.827	0.836	0.869	0.844	2	0.842	0.857	0.818	0.841	0.894	0.838
3	0.902	0.874	0.848	0.838	0.875	0.826	14	0.837	0.862	0.820	0.834	0.853	0.908
	0.889	0.837	0.834	0.836	0.834	0.845	6	0.906					
				· 0.0°									20
p <sub>t2</sub>	/p <sub>t∞</sub> =	0.71		$_1/m_\infty =$	U.12	$\Delta_1$	p <sub>t2</sub> = -	U.1C			p <sub>2</sub> /p <sub>0</sub>	ω = _<1	. 30
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.951	0.907	0.926	0.898	0.914	0.861	2	0.921	0.932		0.943		0.878
3	<b>51</b>			0.889		1 1		0.903	1				
5	1		<del> </del>	0.884				0.963				<del></del>	
				0.0°			$/m_{\infty} =$	0.93	38		settin		
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.930	0.891	0.910	0.887	0.918	0.866	2	0.894	0.915	0.890	0.922	0.914	0.884
3	0.947	0.917	0.911	0.881	0.909	0.849	4	1			0.897		
5	0.931	0.895	0.911	0.884	0.898	0.859	6	1			0.902	†	1
				0.0			•	0.938	3	<u> </u>	settin	g = <u>B</u>	
₱ <sub>t</sub> ;	<sub>2</sub> /p <sub>t</sub> =	0.873	<u> </u>	$_{\rm ol}/{\rm m}_{\infty} =$	0.09	91_ 4	p <sub>t2</sub> = .	0.098	<del></del>		p <sub>2</sub> /p	<u>~ = _20</u>	).31
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.907	0.857	0.852	0.854	0.887	0.850	2	0.859	0.873	0.843	0.879	0.896	0.878
3	+		1	0.848	<del> </del>		<del> </del>	#	<del>                                     </del>	<del>                                     </del>		<del></del>	0.921
	<del>                                     </del>	<del>                                     </del>	t		<del></del>	<del> </del>	t ·	11	<del></del>	1	† ····-	1	1

6

0.924 0.892 0.895 0.871 0.887 0.875

0.900 0.855 0.856 0.854 0.859 0.847

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\bar{p}_{\rm t_2}/p_{\rm t_\infty}$  - Continued (a) 1.50 D inlet with vortex generators

$M_{\infty} =$	2.7	75	<u></u> α =	0.0	0	m <sub>o</sub>	$/m_{\infty} = .$	0.938	3	Exit s	etting	=	C
P <sub>tz</sub>	/p <sub>t</sub> =	0.90	9 m <sub>t</sub>	/m <sub>∞</sub> =	0.10	<u>ο</u> 4 Δ	.p <sub>t2</sub> =.	0.12	<u> </u>		$p_2/p_{\alpha}$		1.08
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.947	0.902	0.925	0.887	0.906	0.853	2	0.889	0.909	0.886	0.946		0.856
3	0.941	0.936	0.943	0.892	0.928	0.865		0.895	0.908	0.907	0.903	0.908	0.921
5	0.946	0.908	0.934	0.878	0.885	0.856	6	0.953	0.937	0.937	0.904	0.930	0.847
M <sub>∞</sub> :	_ 2.	75	_ α =	. 0.0	o°	m <sub>O.</sub>	$/m_{\infty} =$	0.93	38	Exit	settin	g =(	2
₽ <sub>t₂</sub>	/p <sub>t</sub> =	0.879	<u>9</u> mb	$_{l}/m_{\infty} =$	0.08	<u>37</u> Δ:	p <sub>t2</sub> = -	0.112	2		p <sub>2</sub> /p	∞ = <u>2</u> (	0.25
RAKE			TUBE	NO.			RAKE	11		TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	T	5	6
1	0.918	0.867	0.866	0.853	0.882	0.838	_	0.857	0.882	0.851	0.900	0.930	0.832
3	0.912	0.906	0.905	0.854	0.882	0.849	<b>.</b> .	0.865	"		$\overline{}$		
5	0.907	0.868	0.873	0.851	0.851	0.837		0.929					
								1		/ - '	10.011		
M <sub>∞</sub> =	2.5							0.85					
		50	α =	0.0	)°	m <sub>O</sub>	/m <sub>∞</sub> =		51_	Exit	settin		
p̄ <sub>t₂</sub>		50	α =	$\frac{0.0}{1/m_{\infty}} =$	)°	m <sub>O</sub>	/m <sub>∞</sub> =	0.85	51_	Exit	setting	g =A	
P <sub>t</sub>		0.930	$\alpha = 0$ $m_b$ TUBE	$\frac{0.0}{1/m_{\infty}} =$	0.13	m <sub>o</sub>	$/m_{\infty} = 0$ $p_{t_2} = 0$ RAKE	0.85	51_	Exit	setting	g = _A	.76
P <sub>tz</sub>	/p <sub>t</sub> =	0.930	$\alpha = \frac{\alpha}{2}$ TUBE	$\frac{0.0}{1/m_{\infty}} = \frac{0.0}{1/m_{\infty}}$ NO.	0.13	m <sub>o</sub>	$/m_{\infty} = $ $p_{t_2} = $ RAKE	0.85	2	Exit	p <sub>2</sub> /p <sub>0</sub>	g =A	.76
RAKE NO.	/Pt <sub>∞</sub> =	0.930 2 0.906	$\alpha = \frac{\alpha}{2}$ TUBE $\frac{3}{0.932}$	$0.0$ $1/m_{\infty} = 0.0$ NO. 4	0.13 5 0.943	m <sub>o</sub> 30 △: 6	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$ $m_{\infty} = 1$	0.85	2 0.932	TUBE 3 0.911	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.949	g =	6
RAKE NO.	p <sub>t∞</sub> =	2 0.936 0.943	α =  TUBE  3 0.932 0.952	$0.0$ $1/m_{\infty} =$ $0.0$ $0.0$ $0.909$ $0.920$	0.13 5 0.943 0.930	m <sub>o</sub> 30 △: 6 0.917 0.889	$/m_{\infty} =$ $p_{t_2} = -$ RAKE NO.	0.85	2 0.932 0.911	TUBE 3 0.911 0.910	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.949 0.947	3 = A	6 0.926 0.960
RAKE NO.	/Pt <sub>∞</sub> =	2 0.906 0.943 0.908	α =  TUBE  3 0.932 0.952 0.939	$0.0$ $1/m_{\infty} =$ $0.0$ $0.0$ $0.909$ $0.920$	0.13 5 0.943 0.930 0.925	6 0.917 0.889	$/m_{\infty} =$ $p_{t_2} =  RAKE$ $NO$ . $2$ $4$	0.85 0.076 1 0.904 0.915	2 0.932 0.911 0.944	TUBE 3 0.911 0.910 0.946	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.949 0.947 0.943	5 0.950 0.944 0.948	6 0.926 0.960 0.907
$\overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} =$	Pt <sub>w</sub> =	2 0.936 0.906 0.943 0.908	α =  D mb  TUBE  3  0.932  0.939  α =	$0.0$ $1/m_{\infty} =$ $NO.$ $4$ $0.909$ $0.920$ $0.923$ $0.0^{\circ}$	0.13 5 0.943 0.930 0.925	6 0.917 0.889 0.906	$m_{\infty} = 1$	0.85 0.076 1 0.904 0.915 0.949	2 0.932 0.911 0.944	TUBE 3 0.911 0.910 0.946	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.949 0.947 0.943 setting	5 0.950 0.944 0.948	6 0.926 0.960 0.907
$\overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	Pt <sub>w</sub> =	2 0.936 0.906 0.943 0.908	α =  D mb  TUBE  3  0.932  0.939  α =	$\begin{array}{c} \cdot & 0.0 \\ 1/m_{\infty} = \\ \cdot & 0.0 \\ \cdot & 4 \\ \cdot & 0.909 \\ \cdot & 0.920 \\ \cdot & 0.923 \\ \cdot & 0.0 \\ \cdot &$	0.13 5 0.943 0.930 0.925	6 0.917 0.889 0.906	$m_{\infty} = 1$ $p_{t_2} = 1$	0.85 0.076 1 0.904 0.915 0.949	2 0.932 0.911 0.944	TUBE 3 0.911 0.910 0.946	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.949 0.947 0.943 setting	5 0.950 0.944 0.948	6 0.926 0.960 0.907
$\bar{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$	Pt <sub>w</sub> =	2 0.936 0.906 0.943 0.908	α =  TUBE  3 0.932 0.952 0.9539 α =  m <sub>b</sub>	$\begin{array}{c} \cdot & 0.0 \\ 1/m_{\infty} = \\ \cdot & 0.0 \\ \cdot & 4 \\ \cdot & 0.909 \\ \cdot & 0.920 \\ \cdot & 0.923 \\ \cdot & 0.0 \\ \cdot &$	0.13 5 0.943 0.930 0.925	6 0.917 0.889 0.906	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$	0.85 0.076 1 0.904 0.915 0.949	2 0.932 0.911 0.944	TUBE 3 0.911 0.910 0.946 Exit	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.949 0.947 0.943 setting	5 0.950 0.944 0.948	6 0.926 0.960 0.907
$\overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	Pt <sub>w</sub> =	2 0.906 0.943 0.908 0.903	α =  TUBE  3  0.932  0.939  α =  10  TUBE  3	$0.0$ $1/m_{\infty} =$ $NO.$ $4$ $0.909$ $0.920$ $0.923$ $0.0^{\circ}$ $1/m_{\infty} =$ $NO.$	0.13 5 0.943 0.930 0.925	m <sub>0</sub> 30 Δ; 6 0.917 0.889 0.906 m <sub>0</sub> Δ4 Δ	$m_{\infty} = 1$ $p_{t_2} = 1$	0.85 0.076 1 0.904 0.915 0.949 0.85	2 0.932 0.911 0.944	TUBE 3 0.911 0.910 0.946 Exit TUBE 3	setting $p_2/p_0$ NO.  4 0.949 0.947 0.943 setting $p_2/p$ NO.	5 0.950 0.944 0.948 8 = 14	6 0.926 0.960 0.907
$\overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	P <sub>t</sub> =	2 0.906 0.943 0.908 0.901 2 0.863	α =  TUBE  3  0.932  0.952  0.939  α =  TUBE  3  0.879	$0.0$ $1/m_{\infty} =$ $NO.$ $4$ $0.909$ $0.920$ $0.923$ $0.0^{\circ}$ $1/m_{\infty} =$ $NO.$ $4$	0.13 5 0.943 0.930 0.925 0.10	m <sub>o</sub> 30 Δ: 6 0.917 0.889 0.906 m <sub>o</sub> 0.4 Δ 6 0.898	$m_{\infty} = 1$	0.85 0.076 1 0.904 0.915 0.949 0.85 0.108	2 0.932 0.911 0.944 51 3	TUBE 3 0.911 0.910 0.946 Exit TUBE 3 0.872	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.949 0.947 0.943 setting P <sub>2</sub> /P NO. 4	$3 = A$ $\infty = 14$ $5$ $0.950$ $0.944$ $0.948$ $8 = A$ $\infty = 14$ $5$ $0.922$	6 0.926 0.960 0.907 15 6 0.939

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\bar{p}_{t_2}/p_{t_\infty}$  - Continued (a) 1.50 D inlet with vortex generators

$M_{\infty} =$	2.	50	<u> </u>	0.0	0°	m <sub>C</sub>	$m_{\infty} = 1$	0.8	51	Exit s	etting	· =	C
P <sub>t</sub>	<sub>2</sub> /p <sub>t</sub> , =	0.92	6 m <sub>t</sub>	ol/m <sub>∞</sub> =		<u>5</u>	¹ <sup>p</sup> t2 =.	0.08	3		p <sub>2</sub> /p <sub>o</sub>	. = _1 <sup>1</sup>	4.56
RAKE		<del>,</del>	TUBE		<b>-</b>		RAKE			TUBE	NO.		
NO.		2		4			NO.	1	2	3	4	5	6
		0.895					<u> </u>	0.888	0.910	0.888	0.950		
		0.935		<del></del>			1	0.891	0.896	0.900	0.958	0.951	0.961
5	0.927	0.900	0.930	0.930	0.913	0.897	6	0.939	0.940	0.964	0.943	0.961	0.891
					0.85				g =(				
<sub>pt₂</sub>	/p <sub>t</sub> =	0.892	2 m <sub>b</sub>	$_1/m_{\infty} =$	0.078	<u>B</u>	p <sub>t2</sub> = -	0.118	3		p <sub>2</sub> /p	<sub>∞</sub> = <u>1</u> 3	3.85
RAKE		· · · · ·	TUBE				RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
P .	11	0.851					2	0.842		0.869	0.923	0.939	0.932
•	1)	0.879					lμ	0.849					
5	0.864	0.856	0.882	0.912	0.892	0.883		0.869					
M <sub>∞</sub> =	2.5	50	_ α =	0.0	)°	m <sub>O</sub>		0.851					
₱ <sub>t₂</sub>							$/m_{\infty} = $		-	Exit	settin	g =	:
̄p <sub>t₂</sub>	/p <sub>t<sub>∞</sub></sub> =	0.843	3_ m <sub>b</sub>	$_{1}/m_{\infty} =$	0.072	Σ Δ	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE	0.851	-	Exit	p <sub>2</sub> /p <sub>0</sub>	g =	:
P <sub>t2</sub> RAKE NO.	/p <sub>t</sub> =	2	TUBE	$1/m_{\infty} = \frac{1}{1}$	0.072	<u>2</u> Δ:	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE NO.	0.851	2	Exit s	P <sub>2</sub> /P <sub>0</sub> NO.	g = _ 0 <sub>w</sub> = _12	2.84 6
RAKE NO.	/p <sub>t<sub>w</sub></sub> =	2	TUBE 3 0.815	$1/m_{\infty} = \frac{1}{1}$ NO. 4 0.831	0.072 5 0.858	6 0.840	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.851 0.148 1 0.802	2	TUBE 3 0.812	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.874	g = _ 0	6
Ptz RAKE NO.  1 3	/p <sub>t</sub> <sub>∞</sub> =	2 0.800 0.846	TUBE 3 0.815 0.899	$1/m_{\infty} = \frac{1}{1}$ NO. 4 0.831 0.832	0.072 5 0.858 0.822	6 0.840 0.851	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.851 0.148 1 0.802 0.792	2 0.821 0.823	TUBE 3 0.812 0.805	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.874 0.873	5 0.866 0.875	6 0.874 0.918
Ptz RAKE NO.  1 3	/p <sub>t</sub> <sub>∞</sub> =	2	TUBE 3 0.815 0.899	$1/m_{\infty} = \frac{1}{1}$ NO. 4 0.831 0.832	0.072 5 0.858 0.822	6 0.840 0.851	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.851 0.148 1 0.802 0.792	2 0.821 0.823	TUBE 3 0.812 0.805	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.874	5 0.866 0.875	6 0.874 0.918
RAKE NO.	/p <sub>t<sub>∞</sub></sub> =  1  0.826  0.847  0.843	2 0.800 0.846 0.814	TUBE 3 0.815 0.899 0.840	$1/m_{\infty} = 1/m_{\infty} = 1/m_{\infty}$ NO. 4 0.831 0.832 0.822	5 0.858 0.822 0.829	6 0.840 0.851 0.840	$/m_{\infty} = \frac{1}{2}$ RAKE NO.	0.851 0.148 1 0.802 0.792	2 0.821 0.823 0.849	TUBE 3 0.812 0.805	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.874 0.873 0.856	5 0.866 0.875 0.841	6 0.874 0.918 0.877
RAKE NO.  1  3 $M_{\infty} =$	/p <sub>t<sub>∞</sub></sub> =  1  0.826  0.847  0.843	2 0.800 0.846 0.814	3 m <sub>b</sub> TUBE 3 0.815 0.899 0.840 α =	$1/m_{\infty} = \frac{1}{1}$ NO. 4 0.831 0.832 0.822	0.072 5 0.858 0.822 0.829	6 0.840 0.851 0.840	$/m_{\infty} = \frac{1}{2}$ $/m_{\infty} = \frac{1}{2}$ $/m_{\infty} = \frac{1}{2}$ $/m_{\infty} = \frac{1}{2}$	0.851 0.148 1 0.802 0.792 0.848	2 0.821 0.823 0.849	TUBE 3 0.812 0.805	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.874 0.873 0.856	5 0.866 0.875 0.841	6 0.874 0.918 0.877
RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	/p <sub>t<sub>∞</sub></sub> =  1  0.826  0.847  0.843	2 0.800 0.846 0.814	3 m <sub>b</sub> TUBE 3 0.815 0.899 0.840 α =	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.831 0.832 0.822 $\frac{1}{m_{\infty}} = \frac{1}{m_{\infty}}$	0.072 5 0.858 0.822 0.829	6 0.840 0.851 0.840	$/m_{\infty} = \frac{1}{2}$ $/m_{\infty} = \frac{1}{2}$ $/m_{\infty} = \frac{1}{2}$ $/m_{\infty} = \frac{1}{2}$	0.851 0.148 1 0.802 0.792 0.848 0.738	2 0.821 0.823 0.849	TUBE 3 0.812 0.805	setting $p_2/p_0$ NO. 4 0.874 0.873 0.856 setting $p_2/p_0$	5 0.866 0.875 0.841	6 0.874 0.918 0.877
RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$	/p <sub>t<sub>∞</sub></sub> =  1  0.826  0.847  0.843	2 0.800 0.846 0.814	TUBE 3 0.815 0.899 0.840 α =	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.831 0.832 0.822 $\frac{1}{m_{\infty}} = \frac{1}{m_{\infty}}$	0.072 5 0.858 0.822 0.829	6 0.840 0.851 0.840	$/m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{2}{4}$ $6$ $/m_{\infty} = \frac{1}{2}$	0.851 0.148 1 0.802 0.792 0.848 0.738	2 0.821 0.823 0.849	TUBE 3 0.812 0.805 0.901 Exit	setting $p_2/p_0$ NO. 4 0.874 0.873 0.856 setting $p_2/p_0$	5 0.866 0.875 0.841	6 0.874 0.918 0.877
RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	/p <sub>t<sub>w</sub></sub> =  1 0.826 0.847 0.843  2.2 /p <sub>t<sub>w</sub></sub> =	2 0.800 0.846 0.814 25	3 m <sub>b</sub> TUBE 3 0.815 0.899 0.840 α = 2 m <sub>b</sub> TUBE 3	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.831 0.832 0.822  0.0 $1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4	0.072 5 0.858 0.822 0.829	6 0.840 0.851 0.840  mod	$/m_{\infty} = \frac{1}{2}$ RAKE NO.  2 4 6 $/m_{\infty} = \frac{1}{2}$ RAKE NO.	0.851 0.148 1 0.802 0.792 0.848 0.738	2 0.821 0.823 0.849	TUBE 3 0.812 0.805 0.901 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.874 0.873 0.856 setting P <sub>2</sub> /P <sub>0</sub> NO. 4	5 =	6 0.874 0.918 0.877
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	/p <sub>t<sub>w</sub></sub> =  1 0.826 0.847 0.843  2.2 /p <sub>t<sub>w</sub></sub> =	2 0.800 0.846 0.814 25 0.952	TUBE 3 0.815 0.899 0.840 α = 2 m <sub>b</sub> TUBE 3 0.953	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.831 0.832 0.822  0.0 $1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.964	0.072 5 0.858 0.822 0.829 0.133	6 0.840 0.851 0.840  mo  6 0.951	$/m_{\infty} =$ $Pt_2 =$ $RAKE$ $NO$ . $2$ $4$ $6$ $/m_{\infty} =$ $Pt_2 =$ $RAKE$ $NO$ . $2$	0.851 0.148 1 0.802 0.792 0.848 0.738	2 0.821 0.823 0.849	TUBE 3 0.812 0.805 0.901 Exit :	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.874 0.873 0.856 setting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.968	5 =	6 0.874 0.918 0.877 0.26
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1	/p <sub>t</sub> =  1 0.826 0.847 0.843  2.2 /p <sub>t</sub> =  1 0.933 0.939	2 0.800 0.846 0.814 25 0.952	TUBE 3 0.815 0.899 0.840 α = 2 m TUBE 3 0.953 0.962	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO. 4 0.831 0.832 0.822 0.0 1/m_{\infty} = \frac{1}{m_{\infty}} NO. 4 0.964	0.072 5 0.858 0.822 0.829 0.00 0.133	6 0.840 0.851 0.840	$/m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $/m_{\infty} = \frac{1}{2}$ RAKE NO.  2  RAKE NO.  2	0.851 0.148 1 0.802 0.792 0.848 0.738 0.048	2 0.821 0.823 0.849 2 0.937 0.928	TUBE 3 0.812 0.805 0.901 Exit s TUBE 3 0.941	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.874 0.873 0.856 setting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.968 0.959	5 0.866 0.875 0.841 3 = A 0.965 0.966	6 0.87 0.91 0.87 0.26 6 0.96

 $M_{\infty} = 2.25$   $\alpha = 0.0^{\circ}$   $m_{0}/m_{\infty} = 0.738$  Exit setting = A

$M_{\infty} =$	2.	25	<u></u> α =	0.0	)°	<sup>m</sup> o	$/m_{\infty} = 1$	0.738	3	E <b>x</b> it s	etting	= B	
P <sub>t2</sub>	/p <sub>t</sub> =	0.902	m <sub>b</sub>	1/m∞ =	0.07	<u>-</u> Δ	p <sub>t2</sub> =_	0.09	98		$p_2/p_{\infty}$	<b>=</b> 9	.30
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.857	0.893	0.927	0.918	0.913	0.893	2	0.855	0.867	0.890	0.914		
3	0.855	0.884	0.907	0.915	0.887	0.912	4	0.863	0.899	0.928	0.940	0.940	0.935
5	0.876	0.877	0.894	0.911	0.901	0.887	6	0.883	0.903	0.922	0.943	0.937	0.937
								0.738			setting p <sub>2</sub> /p <sub>0</sub>	s = <u> </u>	
RAKE		<del></del>	TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2		4	5	6
1	0.917	0.923	0.947	0.960	0.952	0.942					0.962		
3	0.921	0.934	0.953	0.969	0.945	0.952			-		0.964		
5	0.934	0.922	0.951	0.940	0.930	0.925		<del> </del>			0.967		
		25	_ α =	0.0	) °	_ m <sub>O</sub>	$/m_{\infty} =$	0.738	3	Exit	setting	g =	
Pt2	/p <sub>t</sub> =	0.933	<u>m</u> b	$_1/m_\infty =$	0.083	<u>3</u> <u>\( \Delta \) \( \Delta \) </u>	p <sub>t2</sub> =.	0.09	96		p <sub>2</sub> /p <sub>0</sub>	<b>, ≖</b> _ 9	.80
RAKE	/p <sub>t<sub>∞</sub></sub> =		TUBE	NO.			RAKE	II 		TUBE		<b>~</b> 9	.80
			TUBE				RAKE	l .			NO.	<b>. =</b> 9	6
RAKE NO.	1	2	TUBE	NO.	5	6	RAKE NO.	1	2	3 TUBE	NO.	5	6
RAKE NO.	1 0.894	2 0.911	TUBE 3 0.935	NO.	5 0.946	6 0.935	RAKE NO.	1	2	TUBE 3 0.927	NO.	5 0.962	6 0.970
RAKE NO.	1 0.894 0.882	2 0.911 0.908	TUBE 3 0.935 0.935	NO. 4	5 0.946 0.926	6 0.935 0.959	RAKE NO. 2	1 0.885 0.887	2 0.897 0.901	TUBE 3 0.927 0.923	NU. 4 0.961	5 0.962 0.969	6 0.970 0.972
RAKE NO. 1 3 5 $M_{\infty} =$	1 0.894 0.882 0.910	2 0.911 0.908 0.906	TUBE 3 0.935 0.935 0.935 α =	NO. 4 0.956 0.963 0.941	5 0.946 0.926 0.929	6 0.935 0.959 0.918	RAKE NO.  2 4 6	0.885 0.887 0.923	2 0.897 0.901 0.934	3 0.927 0.923 0.958	NO.  4  0.961  0.951  0.965  setting	5 0.962 0.969 0.963	6 0.970 0.972 0.955
RAKE NO. 1 3 5 $M_{\infty} =$	1 0.894 0.882 0.910	2 0.911 0.908 0.906	TUBE 3 0.935 0.935 0.935 α =	NO. 4 0.956 0.963 0.941	5 0.946 0.926 0.929	6 0.935 0.959 0.918	RAKE NO.  2 4 6	1 0.885 0.887 0.923	2 0.897 0.901 0.934	3 0.927 0.923 0.958	NO.  4  0.961  0.951  0.965  setting	5 0.962 0.969 0.963	6 0.970 0.972 0.955
RAKE NO. 1 3 5 $M_{\infty} =$	1 0.894 0.882 0.910	2 0.911 0.908 0.906	TUBE 3 0.935 0.935 0.935 α =	NO. 4 0.956 0.963 0.941 0.0 1/m <sub>∞</sub> =	5 0.946 0.926 0.929	6 0.935 0.959 0.918	RAKE NO.  2 4 6	0.885 0.887 0.923	2 0.897 0.901 0.934	3 0.927 0.923 0.958	NO.  4  0.961  0.951  0.965  setting	5 0.962 0.969 0.963	6 0.970 0.972 0.955
RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$	1 0.894 0.882 0.910	2 0.911 0.908 0.906	TUBE 3 0.935 0.935 0.935 α =	NO. 4 0.956 0.963 0.941 0.0 1/m <sub>∞</sub> =	5 0.946 0.926 0.929	6 0.935 0.959 0.918	RAKE NO.  2 4 6 /m <sub>∞</sub> =	0.885 0.887 0.923	2 0.897 0.901 0.934	TUBE 3 0.927 0.923 0.958 Exit	NO.  4  0.961  0.951  0.965  setting	5 0.962 0.969 0.963	6 0.970 0.972 0.955
RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	1 0.894 0.882 0.910 2.2 /Pt_m =	2 0.911 0.908 0.906 25 0.892	TUBE 3 0.935 0.935 0.935 α = 2	NO.  4  0.956  0.963  0.941  0.0 $1/m_{\infty} = 0.0$	5 0.946 0.926 0.929 0.060	6 0.935 0.959 0.918	RAKE NO. $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO.$	0.885 0.887 0.923 0.738 0.090	2 0.897 0.901 0.934	TUBE 3 0.927 0.923 0.958 Exit	NO.  4 0.961 0.951 0.965 setting	5 0.962 0.969 0.963 x = 0	6 0.970 0.972 0.955 0.06
RAKE NO. 1 3 5 $M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	1 0.894 0.882 0.910 2.2 /Pt_m=	2 0.911 0.908 0.906 25 0.892 2 0.893	TUBE 3 0.935 0.935 0.935 α = 2 m <sub>1</sub> TUBE 3 0.919	NO. 4 0.956 0.963 0.941 0.0 $1/m_{\infty} = 1$	5 0.946 0.926 0.929 0.060 5 0.886	6 0.935 0.959 0.918	RAKE NO. 2 4 6 /m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO. 2	0.885 0.887 0.923 0.738 0.090	2 0.897 0.901 0.934 3 2 0.855	TUBE 3 0.927 0.923 0.958 Exit TUBE 3 0.871	NO.  4 0.961 0.965 0.965 setting	5 0.962 0.969 0.963 s =0	6 0.970 0.972 0.955 0.06

$M_{\infty} =$		00	_ a =	0.0	)°	_ m <sub>o</sub> ,	/m <sub>∞</sub> = _	0.625	F	exit se	tting	<u> </u>	
₽ <sub>t2′</sub>	/p <sub>t</sub> =	0.958	3 <b>m</b> b	$_1/m_\infty =$	0.123	<u> </u>	p <sub>t2</sub> = -	0.043	<u> </u>		$\mathrm{p}_{2}/\mathrm{p}_{\infty}$	<del>-</del> 7	.01
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.937	0.942	0.958	0.975	0.970	0.961	2	0.936	0.938	0.946	0.964	0.973 C	0.974
3	0.945	0.951	0.961	0.975	0.937	0.957	4	0.938	0.938	0.957	0.971	0.977	9.977
5	0.952	0.944	0.965	0.956	0.955	0.960	6	0.953	0.958	0.972	0.974	0.978	0.977
Μ <sub>∞</sub> =		00	<u> </u>	0.0	· · · · · · · · · · · · · · · · · · ·	m <sub>O</sub>	/m <sub>∞</sub> = _	0.625	<u> </u>	Exit s	etting	=_A	
₱ <sub>t2</sub>	$/p_{t_{\infty}}$ =	0.93	5 m <sub>b</sub>	$_1/m_\infty$ =	0.104		p <sub>t2</sub> = -	0.086	5		p <sub>2</sub> /p <sub>x</sub>	= 6.7	1
RAKE			TUBE				RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.898	0.914	0.938	0.952	0.942	0.932	2	0.889	0.896	0.912	0.938	0.954	0.961
3	0.892	0.907	0.933	0.960	0.938	0.952	14	0.889	0.908	0.933	0.961	0.969	0.957
5	0.917	0.922	0.949	0.944	0.942	0.944	6	0.917	0.935	0.960	0.967	0.960	0.959
M <sub>∞</sub> =	2.	00	<u> </u>	. 0.0	)°	m <sub>C</sub>	$m_{\infty} = 1$	0.625		Exit	setting	= <u>A</u>	
$\bar{p}_{t_2}$	/p <sub>t</sub> =	_ 0.88	<u>6</u> m <sub>b</sub>	$_1/m_\infty =$	0.085		p <sub>t2</sub> = .	0.112			p <sub>2</sub> /p <sub>o</sub>	· = _6.	21
RAKE			TUBE	NO.			RAKE	li		TUBE			]
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.845	0.866	0.891	0.914	0.915	0.896	2	0.835	0.852	0.875	0.896	0.911	0.905
3	0.834	0.852	0.872	0.899	0.902	0.905	4	0.840	0.853	0.869	0.903	0.918	0.928
5	0.850	0.865	0.883	0.903	0.923	0.923	6	0.850	0.867	0.885	0.918	0.933	0.933
M <sub>∞</sub> =		.00	_ α =	0.	0°	m <sub>C</sub>	$/m_{\infty} =$	0.625		Exit	settin	s =E	3
₱ <sub>t</sub> ;	_/p <sub>t</sub> =	0.956	<u> </u>	o1/m <sub>∞</sub> =	0.10	<u>4</u>	p <sub>t2</sub> =	0.051	<del></del>		p <sub>2</sub> /p	<u>= 6.</u>	.80
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.931	+ 0.938	0.959	0.975	0.957	0.954	2	*			0.966		
3	0.93	7 0.947	0.961	0.977	0.931	0.964	. 4	0.935	0.933	0.958	0.973	0.976	0.976
5	1	0.943	1		T	!	ii .	0.955	0.961	0.972	0.975	0.975	0.978
<u> </u>				<del></del>									

								0.625			etting	= <u>B</u>	
P <sub>t2</sub>	/p <sub>t</sub> , =	0.943	3_ m <sub>b</sub>	1/m <sub>∞</sub> =	0.095	Δ	p <sub>t2</sub> = -	0.055			$p_2/p_{\infty}$	<b>=</b> 6	.72
RAKE	TUBE NO.									TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.919	0.932	0.946	0.955	0.946	0.930	2	0.912	0.914	0.925	0.960	0.955	0.956
3	0.919	0.932	0.955	0.958	0.936	0.951	4	0.924	0.924	0.945	0.954	0.963	0.960
								0.943	0.950	0.956	0.957	0.963	0.964
	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$												
							_					<u> </u>	
RAKE NO.	1	2	TUBE 3	NO.	5	6	RAKE NO.	1	2	TUBE	NO.		6
1		· · · · · ·								3		5	
	0.856	0.882						0.855 0.863					
	Ţ		7					t					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$													
M <sub>∞</sub> =	2.0	00	α =	0.0	)°	_ m <sub>O</sub>	/m <sub>∞</sub> =	0.625	<u> </u>	Exit	setting	g = _ C	
M <sub>∞</sub> =	= 2.0 _/p <sub>t_o</sub> =	00	α =	$m_{\infty} = 1$	)°	_ m <sub>O</sub>	/m <sub>∞</sub> =	0.625	<u> </u>	Exit	p <sub>2</sub> /p <sub>0</sub>	g = _ C	!
M <sub>∞</sub> =	= 2.0 _/p <sub>t_o</sub> =	00	α = 5 m <sub>b</sub>	$m_{\infty} = \frac{0.0}{1}$	)°	_ m <sub>o</sub>	$/m_{\infty} =$ $p_{t_2} =$ RAKE	0.625	<u> </u>	Exit:	p <sub>2</sub> /p <sub>0</sub>	g = _ C	!
$M_{\infty} = \overline{p}_{t_2}$	= 2.0 /p <sub>t</sub> =	0.95	α =  TUBE	$\frac{1}{m_{\infty}} = \frac{1}{m_{\infty}}$ NO.	0.090 5	m <sub>o</sub>	$/m_{\infty} =$ $p_{t_2} =$ RAKE	0.625	2	TUBE	p <sub>2</sub> /p <sub>0</sub>	s = _ 0 = _ 6	6
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE	2.0 /p <sub>t</sub> <sub>∞</sub> =	0.955 2	α =  TUBE 3 0.959	$0.0$ $1/m_{\infty} = 0.0$ $0.0$ $0.0$ $0.0$	0.090 5 0.949	m <sub>o</sub> )6	/m <sub>∞</sub> =  Pt <sub>2</sub> =  RAKE  NO.	0.625	2	TUBE 3 0.944	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.973	s = _ 0 s = _ 6 5 0.977	6 0.978
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.  1 3	2.0  /Pt <sub>w</sub> =  1  0.931  0.930	0.955 2 0.934	α =  TUBE  3 0.959 0.963	$0.0$ $1/m_{\infty} =$ $0.0$ $0.0$ $0.0$ $0.0$ $0.0$ $0.0$	5 0.949 0.944		$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.625 0.057 1 0.923	2 0.926 0.930	TUBE 3 0.944 0.957	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.973	5 = 0 5 0.977 0.975	6 0.978 0.971
$M_{\infty} = \frac{\overline{p}_{tz}}{\overline{p}_{tz}}$ RAKE NO.  1  3  5	2.0  /Pt <sub>w</sub> =  1  0.931  0.930  0.948	2 0.934 0.944 0.937	α =  TUBE  3  0.959  0.963  0.966	$0.0$ $1/m_{\infty} =$ $0.0$ $4$ $0.974$ $0.977$ $0.954$	5 0.949 0.944 0.936	6 0.947 0.974 0.932	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$ $m_{\infty} = 1$ $m_{\infty} = 1$	0.625 0.057 1 0.923 0.931 0.954	2 0.926 0.930 0.961	TUBE 3 0.944 0.957 0.972	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.973 0.974 0.974 settin	5 0.977 0.975 0.972	6 0.978 0.971 0.975
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{tz}$	2.0  /Pt <sub>w</sub> =  1  0.931  0.930  0.948	2 0.934 0.944 0.937	α =  TUBE  3  0.959  0.963  0.966  α =  6 m <sub>t</sub>	$0.0$ $1/m_{\infty} =$ $0.0$ $4$ $0.974$ $0.977$ $0.954$ $0.0$ $0.1/m_{\infty} =$	5 0.949 0.944 0.936	6 0.947 0.974 0.932	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$	0.625 0.057 1 0.923 0.931 0.954 0.625	2 0.926 0.930 0.961	TUBE 3 0.944 0.957 0.972	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.973 0.974 0.974 settin	5 0.977 0.975 0.972	6 0.978 0.971 0.975
$M_{\infty} = \frac{\overline{p}_{tz}}{\overline{p}_{tz}}$ RAKE NO.  1  3  5	2.0 /Pt <sub>w</sub> = 1 0.931 0.930 0.948 = 2.0	2 0.934 0.944 0.937 00	α =  TUBE  3  0.959  0.963  0.966  α =  6 m <sub>b</sub>	$0.0$ $1/m_{\infty} =$ $0.0$ $4$ $0.974$ $0.977$ $0.954$ $0.0$ $0.1/m_{\infty} =$ $0.0$	5 0.949 0.944 0.936	6 0.947 0.974 0.932 mo	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{\infty} = 1$ $m_{\infty} = 1$ $m_{\infty} = 1$	0.625 0.057 1 0.923 0.931 0.954 0.625 0.071	2 0.926 0.930 0.961	TUBE 3 0.944 0.957 0.972 Exit	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.973 0.974 0.974 settin	5 0.977 0.975 0.972 8 =	6 0.978 0.971 0.975
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.  1  3  5  M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.	2.0  /pt <sub>w</sub> =  1 0.931 0.930 0.948  2.0  /pt <sub>w</sub> =	2 0.934 0.944 0.937 00 0.93	α =  TUBE  3  0.959  0.966  α =  6  m <sub>1</sub> TUBE  3	$0.0$ $1/m_{\infty} =$ $0.0$ $4$ $0.974$ $0.977$ $0.954$ $0.0$ $0.1/m_{\infty} =$ $0.0$ $1/m_{\infty} =$	5 0.949 0.944 0.936	6 0.947 0.974 0.932 mo	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.	0.625 0.057 1 0.923 0.931 0.954 0.625 0.071	2 0.926 0.930 0.961	TUBE 3 0.944 0.957 0.972 Exit TUBE	setting $p_2/p_0$ NO. 4 0.973 0.974 0.974 setting $p_2/p_0$ NO.	5 0.977 0.975 0.972 8 =	6 0.978 0.971 0.975
$M_{\infty} = \overline{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{tz}$ RAKE NO.	2.0  /Pt <sub>w</sub> =  1  0.931  0.930  0.948  2.0  /Pt <sub>w</sub> =  1  0.902	2 0.934 0.944 0.937 00 0.93	α =  TUBE  3  0.959  0.963  0.966  α =  TUBE  3  0.944	$\begin{array}{c} 0.0 \\ 1/m_{\infty} = \\ 1/m_{$	5 0.949 0.944 0.936 0.079	6 0.947 0.974 0.932 mo 9 6 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.  2	0.625 0.057  1 0.923 0.931 0.954 0.625 0.071	2 0.926 0.930 0.961	TUBE 3 0.944 0.957 0.972 Exit TUBE 3 0.927	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.973 0.974 0.974 settin P <sub>2</sub> /P NO.  4 0.957	5 0.977 0.975 0.972 8 =	6 0.978 0.971 0.975 5.61 6 0.953
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.  1  3  5  M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.	2.0  /pt <sub>w</sub> =  1  0.931  0.930  0.948  2.0  /pt <sub>w</sub> =  1  0.902  0.893	2 0.934 0.944 0.937 00 0.93	α =  TUBE  3  0.959  0.966  α =  TUBE  3  0.944  0.937	$\begin{array}{c} & 0.0 \\ 1/m_{\infty} = \\ & NO. \\ & 4 \\ & 0.974 \\ & 0.977 \\ & 0.954 \\ & & 0.6 \\ & & &$	5 0.949 0.944 0.936 0.979 5 0.930	6 0.947 0.932 0.932 0.941 0.922 0.941	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  4	0.625 0.057  1 0.923 0.931 0.954 0.625 0.071  1 0.894 0.907	2 0.926 0.930 0.961 5 2 0.901 0.920	TUBE 3 0.944 0.957 0.972 Exit  TUBE 3 0.927 0.951	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.973 0.974 0.974 settin p <sub>2</sub> /p NO.  4 0.957	5 0.977 0.975 0.972 8 =	6 0.978 0.971 0.975

M <sub>∞</sub> =	2.0	00	_ α =	0.0	•	_ m <sub>O</sub> /	/m <sub>∞</sub> = -	0.625	I	Exit se	etting	<u> </u>		
$\bar{p}_{t_2}/p_{t_\infty} = 0.902$ $m_{b_1}/m_\infty = 0.068$ $\Delta p_{t_2} = 0.125$ $p_2/p_\infty = 6.27$														
RAKE	RAKE TUBE NO.  NO. 1 2 3 4 5 6							TUBE NO.						
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6	
1	0.854	0.876	0.895	0.925	0.932	0.922	2	0.847	0.869	0.889	0.915	0.931	0.940	
3	o.845	0.860	0.881	0.912	0.919	0.928	4	0.852	0.866	0.890	0.913	0.937	0.953	
5	0.866	o.888	0.907	0.916	0.928	0.931	6	0.865	0.881	0.902	0.925	0.948	0.958	
M <sub>∞</sub> =	$M_{\infty} = 1.75$ $\alpha = 0.0^{\circ}$ $m_{O}/m_{\infty} = 0.521$ Exit setting = A												·	
₽t2	$/p_{t_{\infty}} =$	0.95	m <sub>b</sub>	$_1/m_\infty$ =	0.099	<u>)</u> Δ <sub>1</sub>	pt2 = -	0.036			p <sub>2</sub> /p <sub>o</sub>	o =4	.56	
RAKE			TUBE	NO.			RAKE			TUBE	NO.			
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	6	
1	0.931	0.944	0.958	0.965	0.951	0.937	2	0.935	0.941	0.950	0.965	0.964	0.961	
_ 3	0.946	0.951	0.961	0.964	0.949	0.950	14	0.945	0.944	0.951	0.953	0.949	0.945	
5	0.948	0.949	0.956	0.944	0.949	0.939	6	0.950	0.954	0.961	0.963	0.960	0.959	
5	5 0.948 0.949 0.956 0.944 0.949 0.939 6 0.950 0.954 0.961 0.963 0.960 0.959 $M_{\infty} = 1.75 \qquad \alpha = 0.0^{\circ} \qquad m_{0}/m_{\infty} = 0.521 \qquad \text{Exit setting} = A$													
M <sub>∞</sub> =	1.7	75	α =	= 0.0	)°	L.,	•	<b></b>						
				$\frac{0.0}{1/m_{\infty}} =$		m <sub>O</sub>	$/m_{\infty} = 1$	0.521		Exits	setting	g =A		
			_ m <sub>b</sub>			m <sub>O</sub>	$/m_{\infty} = 1$	0.521		Exits	p <sub>2</sub> /p <sub>c</sub>	g =A		
P <sub>t2</sub>		0.92	D mb	$_1/m_\infty =$	0.08	m <sub>O</sub>	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE	0.521	·	Exit s	p <sub>2</sub> /p <sub>c</sub>	g =A	.32	
̄p <sub>t₂</sub>	/p <sub>t</sub> =	2	TUBE	$1/m_{\infty} =$	0.08	m <sub>o</sub>	$/m_{\infty} = \frac{1}{2}$ $p_{t_2} = \frac{1}{2}$ RAKE	0.521	2	Exit s	setting $p_2/p_c$	S = A	6	
P <sub>t2</sub>	p <sub>t</sub> <sub>∞</sub> =	2	TUBE 3 0.915	$1/m_{\infty} = 0$ NO.	0.08 <sup>r</sup> 5 0.934	m <sub>o</sub> 76 0.929	$/m_{\infty} = $ $p_{t_2} = $ RAKE NO.	0.521 0.07 1 0.889	2	TUBE 3 0.925	p <sub>2</sub> /p <sub>c</sub>	5 =A 5 0.947	6 0.940	
RAKE NO.	/p <sub>t</sub> <sub>∞</sub> =	2 0.899 0.908	TUBE 3 0.915 0.927	$1/m_{\infty} = 0.931$	0.08° 5 0.934 0.933		$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.521 0.07 1 0.889	2 0.900 0.926	TUBE 3 0.925 0.933	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.943	5 = _A 5 0.947 0.918	6 0.940 0.904	
Pt2  RAKE NO.  1  3  5	/p <sub>t</sub> <sub>∞</sub> =	2 0.899 0.908 0.934	TUBE 3 0.915 0.927 0.952	$1/m_{\infty} = 0.931$	0.08° 5 0.934 0.933	6 0.929 0.929	$/m_{\infty} = \frac{1}{2}$ RAKE NO.	0.521 0.07 1 0.889 0.920	2 0.900 0.926 0.924	TUBE 3 0.925 0.933 0.944	p <sub>2</sub> /p <sub>c</sub> NO. 4 0.943 0.927	5 = A 5 0.947 0.918 0.949	6 0.940 0.904 0.937	
RAKE NO.  1  3  5	Pt <sub>w</sub> =   1   0.887   0.901   0.926   1.7	2 0.899 0.908 0.934	TUBE 3 0.915 0.927 0.952 α =	$1/m_{\infty} =$ NO. 4 0.931 0.936 0.927	0.08° 5 0.934 0.933 0.927	m <sub>o</sub> 7	$/m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{2}{4}$ $\frac{4}{6}$	0.521 0.07 1 0.889 0.920 0.903	2 0.900 0.924	TUBE 3 0.925 0.933 0.944	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.943 0.927 0.951 setting	5 = A 5 0.947 0.918 0.949	6 0.940 0.904 0.937	
RAKE NO.  1  3  5	Pt <sub>w</sub> =   1   0.887   0.901   0.926   1.7	2 0.899 0.908 0.934	TUBE 3 0.915 0.927 0.952 α = 6 m <sub>t</sub>	$1/m_{\infty} =$ NO.  4  0.931  0.936  0.927	0.08° 5 0.934 0.933 0.927	m <sub>o</sub> 7	$/m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{2}{4}$ $\frac{4}{6}$	0.521 0.07 1 0.889 0.920 0.903	2 0.900 0.924	TUBE 3 0.925 0.933 0.944	P <sub>2</sub> /P <sub>c</sub> NO.  4  0.943  0.927  0.951  setting	5 = A 5 0.947 0.918 0.949	6 0.940 0.904 0.937	
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	Pt <sub>w</sub> =   1   0.887   0.901   0.926   1.7	2 0.899 0.908 0.934	TUBE 3 0.915 0.927 0.952 α = 6 m <sub>t</sub>	$1/m_{\infty} =$ NO.  4  0.931  0.936  0.927  0 $1/m_{\infty} =$	0.08° 5 0.934 0.933 0.927	m <sub>o</sub> 7	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$	0.521 0.07 1 0.889 0.920 0.903	2 0.900 0.924	TUBE 3 0.925 0.933 0.944 Exit	P <sub>2</sub> /P <sub>c</sub> NO.  4  0.943  0.927  0.951  setting	5 = A 5 0.947 0.918 0.949	6 0.940 0.904 0.937	
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	p <sub>t</sub> =	2 0.899 0.908 0.934 75 0.85	TUBE 3 0.915 0.927 0.952 α = 6 m TUBE 3	$1/m_{\infty} =$ NO.  4  0.931  0.936  0.927  0 $1/m_{\infty} =$ NO.	0.08° 5 0.934 0.933 0.927 .0°	m <sub>0</sub> 7 Δ: 6 0.929 0.929 0.911 m <sub>0</sub> 8 Δ	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE	0.521 0.07 1 0.889 0.920 0.903 0.52	2 0.900 0.926 0.924	TUBE 3 0.925 0.933 0.944 Exit TUBE 3	setting $p_2/p_0$ NO.  4 0.943 0.927 0.951 setting $p_2/p_0$ NO.	5 = _A 5 = _4 5 0.947 0.949 3 =	6 0.940 0.904 0.937 A 4.02	
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1	Pt <sub>w</sub> =	2 0.899 0.908 0.934 75 0.85	TUBE  3 0.915 0.927 0.952 α = 6 m <sub>t</sub> TUBE 3 0.889	$1/m_{\infty} =$ NO.  4  0.931  0.936  0.927  0 $1/m_{\infty} =$ NO.	0.08° 5 0.934 0.933 0.927 0° 0.07	m <sub>o</sub> 7 Δ: 6 0.929 0.929 0.911 m <sub>o</sub> 8 Δ	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  RAKE  RAKE	0.521 0.07 1 0.889 0.920 0.903 0.52 0.081 1 0.859	2 0.900 0.926 0.924 21 4	TUBE 3 0.925 0.933 0.944 Exit TUBE 3 0.889	setting $p_2/p_0$ NO. 4 0.943 0.927 0.951 setting $p_2/p$ NO.	5 = A 5 0.947 0.918 0.949 3 = 5 0.915	6 0.940 0.904 0.937 A 4.02 6 0.909	
$\bar{p}_{tz}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{tz}$ RAKE NO.	Pt <sub>w</sub> =	2 0.899 0.908 0.934 75 0.85	TUBE 3 0.915 0.927 0.952 α = 6 m TUBE 3 0.889 0.874	$1/m_{\infty} =$ NO.  4  0.931  0.936  0.927  0  1/m_{\infty} =  NO.  4  0.904	0.08° 5 0.934 0.933 0.927 .0° 0.07	- mo 7 Δ: 6 0.929 0.929 0.911 - mo 8 Δ 6 0.891 0.878	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$	0.521 0.07 1 0.889 0.920 0.903 0.52 0.081	2 0.900 0.924 0.924 21 4 2 0.870 0.873	TUBE 3 0.925 0.933 0.944 Exit TUBE 3 0.889 0.884	setting $p_2/p_0$ NO. 4 0.943 0.927 0.951 setting $p_2/p_0$ NO. 4 0.904	5 = _A 5 0.947 0.949 8 = 5 0.915 0.902	6 0.940 0.904 0.937 A 4.02 6 0.909 0.895	

M <sub>∞</sub> =	1.7	75	<u>α</u> =	0.	0°	_ <sup>m</sup> o/	/m <sub>∞</sub> = _	0.521	E	Cxit se	etting	= <u>B</u>			
$\bar{p}_{t_2}/p_{t_\infty} = 0.960  m_{bl}/m_\infty = 0.092  \Delta p_{t_2} = 0.050  p_2/p_\infty = 4.58$															
RAKE	L							TUBE NO.							
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6		
_ 1	0.936	0.944	0.961	0.981	0.957	0.941	2	0.943	0.943	0.952	0.968	0.980	0.984		
3	0.946	0.951	0.963	0.976	0.963	0.979	4	0.939	0.939	0.956	0.972	0.982	0.979		
5	0.940	0.945	0.967	0.965	0.951	0.958	6	0.942	0.953	0.973	0.977	0.981	0.982		
M <sub>∞</sub> :	5 0.940 0.945 0.967 0.965 0.951 0.958 6 0.942 0.953 0.973 0.977 0.981 0.982 $M_{\infty} = 1.75 \qquad \alpha = 0.0^{\circ} \qquad m_{0}/m_{\infty} = 0.521 \qquad \text{Exit setting} = B$														
₽ <sub>t2</sub>	$/p_{t_{\infty}} =$	0.932	<u>m</u> b:	$_1/m_\infty =$	0.080	<u>)</u> Δ	p <sub>t2</sub> = -	0.068			p <sub>2</sub> /p <sub>c</sub>	<sub>0</sub> =4	.32		
RAKE			TUBE	NO.			RAKE,	1		TUBE					
NO.	1	2	3	4	5	6	NO.	l	2	3	4	5	6		
1	0.895	0.911	0.931	0.946	0.932	0.924	2	0.898	0.912	0.933	0.948	0.957	0.956		
_3	0.906	0.916	0.939	0.952	0.943	0.947	14	0.914	0.925	0.939	0.941	0.925	0.919		
	н	010	056	000	006	0.012	6	0.7	0 012	0.058	0.051	0 015	0 031		
5	0.923	0.940	0.970	$M_{\infty} = \frac{1.75}{\text{M}_{\infty}} = \frac{0.0^{\circ}}{\text{M}_{\infty}} = \frac{0.0^{\circ}}{\text{M}_{\infty}} = \frac{0.521}{\text{M}_{\infty}} = \frac{0.521}{\text{M}_{\infty}} = \frac{0.948}{\text{M}_{\infty}} = \frac{0.948}{\text{M}_{\infty}$											
M <sub>co</sub> =	= 1.	75	_ α =	. 0	.0°	m <sub>O</sub>	/m <sub>∞</sub> =	0.52			settin	g = _ E	3		
M <sub>co</sub> =	= 1.	75	_ α =	. 0	.0°	m <sub>O</sub>	/m <sub>∞</sub> =	ш.			settin		3		
$M_{\infty} = \bar{p}_{t_2}$	= 1.	75	_ α =	$\frac{1}{m_{\infty}} = \frac{0}{1}$	.0°	m <sub>o</sub>	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$	0.52	<u>L</u>	Exit :	p <sub>2</sub> /p <sub>0</sub>	z =F 	3.94		
$M_{\infty} = \overline{p}_{t_2}$	= 1.	75	α = 8 m <sub>b</sub>	$\frac{0}{1/m_{\infty}} = \frac{0}{1}$	.0°	m <sub>O</sub>	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{0} = 1$ $m_{0} = 1$	0.52	2	Exit :	p <sub>2</sub> /p <sub>0</sub>	3 = _ F = _ 3	3.94 6		
$M_{\infty} = \bar{p}_{t_2}$	= _1. <sup>-</sup>	75	$\alpha = \frac{8}{8}  m_{b}$ TUBE	$\frac{1}{m_{\infty}} = \frac{1}{m_{\infty}}$	.0° 0.066	m <sub>o</sub>	m <sub>w</sub> =  Pt <sub>2</sub> =  RAKE  NO.	0.52	2	TUBE 3 0.890	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.908	5 0.917	3.94 6 0.915		
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE	= 1. 2/pt <sub>w</sub> = 1 0.860	75	α = 8 m <sub>b</sub> TUBE 3 0.893	$m_{\infty} = \frac{0}{1/m_{\infty}}$ No. $\frac{1}{4}$	0.066 5 0.905	m <sub>o</sub> 3 △  6  0.893	$m_{\infty} = 1$ $p_{t_2} = 1$ $m_{0} = 1$ $m_{0} = 1$	0.52	2	TUBE 3 0.890	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.908	5 0.917	3.94 6 0.915		
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.	= 1. p <sub>t</sub> <sub>w</sub> = 1 0.860 0.852	75 = 0.88 2 0.875	α = 8 m <sub>b</sub> TUBE 3 0.893 0.870	$0 = \frac{1}{m_{\infty}} = \frac{0}{1}$ No. 4 0.906 0.881	.0°  0.066  5  0.905  0.893	m <sub>o</sub> 3 Δ 6 0.893 0.886	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ .	0.52 0.081 1 0.872 0.865	2	TUBE 3 0.890 0.883	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.908 0.899	5 0.917 0.908	6 0.915 0.908		
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5	1. Pt <sub>w</sub> = 1. O . 860 O . 852 O . 862 = 1.	75 = 0.88 2 0.875 0.862 0.879 75	α = 8 mb TUBE 3 0.893 0.870 0.895	$\begin{array}{c} & 0 \\ 1/m_{\infty} = \\ 0.906 \\ 0.881 \\ 0.897 \\ \end{array}$	.0°  0.066  5  0.905  0.893  0.925	m <sub>0</sub> 3 Δ 6 0.893 0.886 0.924 m <sub>0</sub>	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ . $2$ $4$ $6$ $1/m_{\infty} =$	0.52 0.081 1 0.872 0.865 0.858 0.52	2 0.879 0.873 0.866	TUBE 3 0.890 0.883 0.877	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.908 0.899 0.887	5 0.917 0.908 0.898 g =	6 0.915 0.908 0.901		
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5	1. Pt <sub>w</sub> = 1. O . 860 O . 852 O . 862 = 1.	75 = 0.88 2 0.875 0.862 0.879 75	α = 8 mb TUBE 3 0.893 0.870 0.895	$\begin{array}{c} & 0 \\ 1/m_{\infty} = \\ 0.906 \\ 0.881 \\ 0.897 \\ \end{array}$	.0°  0.066  5  0.905  0.893  0.925	m <sub>0</sub> 3 Δ 6 0.893 0.886 0.924 m <sub>0</sub>	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ . $2$ $4$ $6$ $1/m_{\infty} =$	0.521 0.081 1 0.872 0.865 0.858	2 0.879 0.873 0.866	TUBE 3 0.890 0.883 0.877	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.908 0.899 0.887	5 0.917 0.908 0.898	6 0.915 0.908 0.901		
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	1. Pt <sub>w</sub> = 1. O . 860 O . 852 O . 862 = 1. Pt <sub>w</sub> =	75 = 0.88 2 0.875 0.862 0.879 75	α = 8 mb TUBE 3 0.893 0.870 0.895 α =	$\begin{array}{c} & 0 \\ 1/m_{\infty} = \\ 0.906 \\ 0.881 \\ 0.897 \\ \end{array}$	.0°  0.066  5  0.905  0.893  0.925	m <sub>0</sub> 3 Δ 6 0.893 0.886 0.924 m <sub>0</sub>	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ RAKE $m_{\infty} = \frac{1}{2}$ RAKE  RAKE	0.52 0.081 1 0.872 0.865 0.858 0.52	2 0.879 0.873 0.866	TUBE 3 0.890 0.883 0.877 Exit	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.908 0.899 0.887	5 0.917 0.908 0.898 g =	6 0.915 0.908 0.901		
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	1. Pt <sub>w</sub> = 1. O . 860 O . 852 O . 862 = 1. Pt <sub>w</sub> =	75 = 0.88 2 0.875 0.862 0.879 75	α = 8 mb TUBE 3 0.893 0.870 0.895 α =	$ \begin{array}{c}                                     $	.0°  0.066  5  0.905  0.893  0.925	m <sub>0</sub> 3 Δ 6 0.893 0.886 0.924 m <sub>0</sub>	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ . $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_2} =$	0.52 0.081 1 0.872 0.865 0.858 0.52	2 0.879 0.873 0.866	TUBE 3 0.890 0.883 0.877 Exit	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.908 0.899 0.887 settin	5 0.917 0.908 0.898 g =	6 0.915 0.908 0.901		
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	1. Pt <sub>w</sub> = 1. 1 0.860 0.852 0.862 = 1. 2/Pt <sub>w</sub> = 1	75 2 0.875 0.862 0.879 75 - 0.96	α = 8 mb TUBE 3 0.893 0.870 0.895 α = 60 mp TUBE	$ \begin{array}{c}                                     $	.0°  0.066  5  0.905  0.893  0.925  .0°	mo  6  0.893  0.886  0.924  mo  9	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ RAKE $m_{\infty} = \frac{1}{2}$ RAKE  RAKE  RO.	0.52 0.081 1 0.872 0.865 0.858 0.52 0.066	2 0.879 0.873 0.866	TUBE 3 0.890 0.883 0.877 Exit	NO. $4$ 0.908 0.899 0.887 settin	5 0.917 0.908 0.898 g =	6 0.915 0.908 0.901		
M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.  1 3 5  M <sub>∞</sub> = $\bar{p}_{t_2}$	1 0.860 0.852 0.862 1.2/Pt	75 = 0.88 2 0.875 0.862 0.879 75 = 0.96	α = 8 mb  TUBE 3 0.893 0.870 0.895 α = 60 mb  TUBE 3 2 0.967	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	.0°  0.066  5  0.905  0.893  0.925  .0°	mo  6  0.893  0.886  0.924  mo  9  6  0.942	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2	0.521 0.081  1 0.872 0.865 0.858 0.52 0.066	2 0.879 0.873 0.866 1 2 0.936 0.929	TUBE 3 0.890 0.883 0.877 Exit  TUBE 3 0.960 0.958	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.908 0.899 0.887 settin P <sub>2</sub> /I NO.  4 0.975 0.978	5 0.917 0.908 0.898 8 =	6 0.915 0.908 0.901		

$M_{\infty} =$	1.5	55	_ a =	0	.0°	_ m <sub>o</sub> ,	/ <sub>m</sub> = _	0.466	<u>.                                    </u>	Exit se	etting	<b>=</b>	Α
₱t₂	/p <sub>t</sub> , =	0.872	<u>m</u> b	$_{l}/m_{\infty} =$	0.059	<u> </u>	p <sub>t2</sub> = -	0.076			$p_2/p_{\infty}$	<u> 2.</u>	99
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.837	0.847	0.856	0.869	0.880	0.868	2	0.850	0.857	0.873	0.888	0.894	0.884
3	0.841	0.852	0.874	0.883	0.891	0.893	4	0.837	0.848	0.861	0.869	0.877	0.881
5	0.854	0.872	0.885	0.874	0.893	0.895	6	0.849	0.865	0.882	0.895	0.903	0.903
M <sub>∞</sub> :	= 1.55	5	<u>α</u> =	:	0.0°	m <sub>O</sub> ,	/m <sub>∞</sub> = _	0.466	5	Exit	setting	g <b>=</b>	В
$\bar{p}_{t_2}$	$/p_{t_{\infty}} =$	0.979	9 m <sub>b</sub>	$_1/m_\infty$ =	0.09	<u>96</u> Δ <sub>1</sub>	9t2 = -	0.048	3		p <sub>2</sub> /p <sub>0</sub>	» =	3.62
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.987	0.988	0.984	0.974	0.963	0.951	2	0.986	0.985	0.996	0.982	0.973	0.971
3	0.991	0.993	0.990	0.979	0.967	0.969	4	0.985	0.984	0.994	0.978	0.974	0.971
5	0.990	0.990	0.988	0.952	0.961	0.963	6	0.998	0.993	0.980	0.973	0.970	0.970
М	- 1.	55	α =	: (	0.0°	mo	$m_{\rm m} =$	0.466	5	Exit	settin	ζ =	В
									_		settin		
								0.466	_			s =	
			1 m <sub>b</sub>					0.038	_				
p <sub>t2</sub>			l m <sub>b</sub>	$_1/m_\infty =$ 2 NO.		7 <u> </u>	p <sub>t2</sub> = .	0.038	3	TUBE	p <sub>2</sub> /p <sub>0</sub>	<u>=</u>	
Pt <sub>2</sub>	p <sub>t</sub> <sub>∞</sub> =	2	TUBE	$_1/m_\infty =$ 2 NO.	0.08	7_ Δ	Pt2 = . RAKE NO.	0.038	2	TUBE	p <sub>2</sub> /p <sub>0</sub>	5	3.50
Pt <sub>2</sub> RAKE	p <sub>t</sub> <sub>w</sub> =	2	TUBE 3 0.959	$1/m_{\infty} = 1$	0.08° 5 0.956	6 0.937	Pt2 = . RAKE NO.	0.038	2	TUBE 3 0.966	p <sub>2</sub> /p <sub>0</sub>	5 0.959	3.50 6 0.961
Pt <sub>2</sub> RAKE	Pt <sub>w</sub> =	2 0.968 0.968	TUBE 3 0.959	$\frac{1}{m_{\infty}} = \frac{1}{2}$ NO. 4 0.961	0.08° 5 0.956 0.957	6 0.937 0.961	Pt2 = .  RAKE NO.  2	0.038 1 0.974 0.972	2 0.971 0.968	TUBE 3 0.966 0.962	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.959 0.960	5 0.959 0.961	3.50 6 0.961
RAKE NO.	Pt <sub>w</sub> =	2 0.968 0.962 0.967	TUBE 3 0.959 0.959 0.959	$1/m_{\infty} =$ NO. 4 0.961 0.960 0.938	0.08° 5 0.956 0.957 0.950	6 0.937 0.961 0.953	Pt2 = .  RAKE NO.  2 4 6	0.038 1 0.974 0.972 0.961	2 0.971 0.968 0.957	TUBE 3 0.966 0.962 0.959	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.959 0.960	5 0.959 0.961 0.962	6 0.961 0.963 0.963
RAKE NO.  1 3 5	Pt <sub>w</sub> =  1  0.966  0.968  0.968	2 0.968 0.968 0.967	TUBE 3 0.959 0.959 0.959 α =	$1/m_{\infty} = 0.961$ 0.961 0.938	0.08°  5  0.956  0.957  0.950	6 0.937 0.961 0.953	Pt₂ =  RAKE NO.  2  4  6	0.038 1 0.974 0.972 0.961	2 0.971 0.968 0.957	TUBE 3 0.966 0.962 0.959	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.959 0.960 0.959 settin	5 0.959 0.961 0.962	3.50 6 0.961 0.963 0.963 B
RAKE NO.  1 3 5	Pt <sub>w</sub> =  1  0.966  0.968  0.968	2 0.968 0.968 0.967	TUBE 3 0.959 0.959 0.959  \[ \alpha = \frac{1}{2} \]	$1/m_{\infty} = 0.961$ 0.961 0.938	0.08°  5  0.956  0.957  0.950	6 0.937 0.961 0.953	$P_{t_2} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE	0.038 1 0.974 0.972 0.961	2 0.971 0.968 0.957	TUBE 3 0.966 0.962 0.959 Exit	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.959 0.960 0.959 settin	5 0.959 0.961 0.962	3.50 6 0.961 0.963 0.963 B
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	Pt <sub>w</sub> =  1  0.966  0.968  0.968	2 0.968 0.968 0.967	TUBE 3 0.959 0.959 0.959  \[ \alpha = \frac{1}{2} \]	$1/m_{\infty} = 0.961$ 0.960 0.938	0.08°  5  0.956  0.957  0.950	6 0.937 0.961 0.953	$P_{t_2} = \frac{1}{2}$ $RAKE = \frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$	0.038 1 0.974 0.972 0.961	2 0.971 0.968 0.957	TUBE 3 0.966 0.962 0.959 Exit	$p_2/p_0$ NO. 4 0.959 0.960 0.959 settin	5 0.959 0.961 0.962	3.50 6 0.961 0.963 0.963 B
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	Ptw =   1   0.968   0.968   1   2   Ptw =   1   2   Ptw =   1   1   1   1   1   1   1   1   1	2 0.968 0.967 .55 - 0.88	TUBE  3  0.959  0.959  0.959  TUBE  3	$1/m_{\infty} = 0.00$ No.  14 0.961 0.960 0.938 15 16 17 17 18 19 19 19 19 19 19 19 19 19 19 19 19 19	0.08°  5  0.956  0.950  0.005	6 0.937 0.961 0.953 	Pt <sub>2</sub> = RAKE NO.  2 4 6 $/m_{\infty}$ = Pt <sub>2</sub> = RAKE NO.	0.038 1 0.974 0.972 0.961 0.466	2 0.971 0.968 0.957 6	TUBE 3 0.966 0.962 0.959 Exit TUBE	$p_2/p_0$ NO. 4 0.959 0.960 0.959 settin $p_2/r$ E NO.	5 0.959 0.961 0.962 8 =	3.50 6 0.961 0.963 0.963 B 3.05
$\bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	1   0.966   0.968   0.968   1	2 0.968 0.962 0.967 .55 0.88	TUBE 3 0.959 0.959 0.959  TUBE 3 0.883	$m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.961 0.960 0.938 $m_{\infty} = \frac{1}{m_{\infty}}$ E NO.  4	0.08°  5  0.956  0.957  0.950  0.0°  5  0.899	6 0.937 0.961 0.953 πο 5 Δ	$P_{t_2} = \frac{1}{2}$ $RAKE NO.$ $\frac{2}{4}$ $6$ $/m_{\infty} = \frac{1}{2}$ $RAKE NO.$ $2$	0.038 1 0.974 0.972 0.961 0.466 0.073	2 0.971 0.968 0.957 6 3	TUBE 3 0.966 0.962 0.959 Exit  TUBE 3 0.889	$p_2/p_0$ NO. 4 0.959 0.960 0.959 settin $p_2/r$ E NO.	5 0.959 0.961 0.962 8 = 5 0.912	3.50 6 0.961 0.963 0.963 B 3.05

$M_{\infty} =$	1.5	5	_ a =		.0°	m <sub>o</sub>	$/m_{\infty} = _{-}$	0.466		Exit se	etting	=	<u>C</u>
$\bar{p}_{t_2}$	/p <sub>t</sub> =	0.976	<u>m</u> b	$_1/m_\infty =$	0.083	Δ	p <sub>t2</sub> =_	0.055			$\mathrm{p_2/p_\infty}$	<b>=</b> <u>3</u>	.52
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.984	0.988	0.986	0.974	0.962	0.948	2	0.982	0.982	0.995	0.943	0.963	0.971
3	0.989	0.992	0.988	0.979	0.967	0.968	4	0.981	0.980	0.994	0.978	0.973	0.970
5	0.988	0.988	0.988	0.943	0.954	0.958	6	0.997	0.993	0.982	0.971	0.970	0.969
M <sub>∞</sub> :	= 1.5	55	<u>α</u> =	C	0.0°	m <sub>O</sub> ,	/m <sub>∞</sub> = _	0.466	· •	Exit	setting	; =	<u>C</u>
₱t₂	$/p_{t_{\infty}} =$	0.963	<u>m</u> b	$_{1}/m_{\infty}$ =	0.063	<u> </u>	p <sub>t2</sub> = -	0.060	·		p <sub>2</sub> /p <sub>o</sub>	s = <u>3</u>	.43
RAKE			TUBE				RAKE			TUBE			
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	6
1	0.927	0.944	0.964	0.984	0.959	0.948	2	0.938	0.943	0.962	0.978	0.981	0.980
3	0.947	0.958	0.965	0.981	0.965	0.971	14	0.934	0.944	0.966	0.980	0.984	0.983
5	0.938	0.948	0.969	0.963	0.957	0.968	6	0.945	0.958	0.983	0.984	0.984	0.983
M <sub>∞</sub> =		55	_ α =	:	.0°	m <sub>o</sub>	$m_{\infty} = 1$	0.46	6	Exit	setting	; =	
											setting $p_2/p_0$		
P <sub>t</sub>				$_1/m_\infty =$							p <sub>2</sub> /p <sub>0</sub>		
	/p <sub>t</sub> _ =	0.90	TUBE	$_1/m_\infty =$	0.050	)Δ;	p <sub>t2</sub> = .		<u>'5</u>	TUBE	p <sub>2</sub> /p <sub>0</sub>	o <b>*</b>	3.10
P <sub>t</sub>	/p <sub>t∞</sub> =	2	TUBE	$1/m_{\infty} =$	0.050	6	P <sub>t2</sub> = - RAKE NO.	0.07	2	TUBE	$p_2/p_0$	• <b>*</b>	3.10
P <sub>t</sub>	/p <sub>t</sub> <sub>∞</sub> =	2 0.884	TUBE 3 0.898	$1/m_{\infty} =$ NO.	0.050 5 0.915	6 0.903	Pt <sub>2</sub> = - RAKE NO.	0.07	2 0.891	TUBE 3 0.906	p <sub>2</sub> /p <sub>0</sub>	5 0.926	3.10 6 0.928
Ptz RAKE NO.	p <sub>t</sub> <sub>∞</sub> =	2 0.884 0.879	TUBE 3 0.898 0.891	$1/m_{\infty} = \frac{1}{1}$ NO. 4	0.050 5 0.915 0.912	6 0.903 0.918	P <sub>t2</sub> = - RAKE NO. 2	0.07 1 0.882 0.861	2 0.891 0.879	TUBE 3 0.906 0.897	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.920	5 0.926 0.915	3.10 6 0.928 0.920
RAKE NO.	p <sub>t</sub> <sub>∞</sub> =	2 0.884 0.879 0.898	TUBE 3 0.898 0.891 0.915	$1/m_{\infty} = 0.909$	5 0.915 0.912 0.923	6 0.903 0.918 0.923	Pt <sub>2</sub> = - RAKE NO. 2 4	0.07 1 0.882 0.861 0.874	2 0.891 0.879 0.885	TUBE 3 0.906 0.897 0.896	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.920 0.903	5 0.926 0.915 0.927	3.10 6 0.928 0.920 0.921
RAKE NO.  1  3  5	/p <sub>t∞</sub> =  1 0.872 0.867 0.867	2 0.884 0.879 0.898	TUBE 3 0.898 0.891 0.915 α =	$1/m_{\infty} =$ NO. 4 0.909 0.901 0.903	5 0.915 0.912 0.923	6 0.903 0.918 0.923	$p_{t_2} = \frac{1}{2}$ RAKE NO. $\frac{2}{4}$ $6$ $/m_{\infty} = \frac{1}{2}$	0.07 1 0.882 0.861 0.874	2 0.891 0.879 0.885	TUBE 3 0.906 0.897 0.896	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.920 0.903 0.910 setting	5 0.926 0.915 0.927	3.10 6 0.928 0.920 0.921
RAKE NO.  1  3  5	/p <sub>t∞</sub> =  1 0.872 0.867 0.867	2 0.884 0.879 0.898	TUBE 3 0.898 0.891 0.915 α =	$1/m_{\infty} =$ NO. 4 0.909 0.901 0.903	5 0.915 0.912 0.923	6 0.903 0.918 0.923	$p_{t_2} = \frac{1}{2}$ RAKE NO. $\frac{2}{4}$ $6$ $/m_{\infty} = \frac{1}{2}$	0.07 1 0.882 0.861 0.874	2 0.891 0.879 0.885	TUBE 3 0.906 0.897 0.896	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.920 0.903 0.910 setting	5 0.926 0.915 0.927	3.10 6 0.928 0.920 0.921
RAKE NO.  1  3  5  M <sub>∞</sub> =	/p <sub>t∞</sub> =  1 0.872 0.867 0.867	2 0.884 0.879 0.898	TUBE 3 0.898 0.891 0.915 α = 8 m <sub>1</sub>	$1/m_{\infty} =$ NO. 4 0.909 0.901 0.903	5 0.915 0.912 0.923	6 0.903 0.918 0.923	$p_{t_2} = \frac{1}{2}$ $RAKE$ $NO.$ $\frac{2}{4}$ $6$ $/m_{\infty} = \frac{1}{2}$	0.07 1 0.882 0.861 0.874	2 0.891 0.879 0.885	TUBE 3 0.906 0.897 0.896 Exit	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.920 0.903 0.910 setting	5 0.926 0.915 0.927	3.10 6 0.928 0.920 0.921
RAKE NO.  1  3  5  M <sub>∞</sub> =   \$\bar{p}_{t_2}\$  RAKE	P <sub>t</sub> =	2 0.884 0.879 0.898	TUBE 3 0.898 0.891 0.915 α = 8	$1/m_{\infty} =$ NO. 4 0.909 0.901 0.903	0.050 5 0.915 0.912 0.923 2.0° 0.12	6 0.903 0.918 0.923 mo	$p_{t_2} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.07 1 0.882 0.861 0.874 0.09	2 0.891 0.879 0.885	TUBE 3 0.906 0.897 0.896 Exit	$p_2/p_0$ NO. 4 0.920 0.903 0.910 setting	5 0.926 0.915 0.927 3 =	3.10 6 0.928 0.920 0.921 A 31.52
RAKE NO.  1 3 5  M <sub>∞</sub> =   \$\bar{p}_{t_2}\$  RAKE NO.	P <sub>t</sub> =	2 0.884 0.879 0.898 00 0.896	TUBE 3 0.898 0.891 0.915  \[ \alpha = \frac{\pi_{\text{true}}}{3} \] TUBE 3 0.885	$1/m_{\infty} =$ NO.  14  0.909  0.901  0.903 $1/m_{\infty} =$ NO.  4	0.050 5 0.915 0.923 2.0° 0.12 5 0.906	6 0.903 0.918 0.923 m <sub>0</sub> 23 Δ	$p_{t_2} = \frac{1}{2}$ $RAKE$ $NO.$ $\frac{2}{4}$ $6$ $/m_{\infty} = \frac{1}{2}$ $RAKE$ $NO.$ $\frac{2}{4}$	0.07 1 0.882 0.861 0.874 0.09	2 0.891 0.879 0.885 - 98 2 0.897	TUBE 3 0.906 0.897 0.896 Exit TUBE 3 0.891	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.920 0.903 0.910 setting P <sub>2</sub> /P	5 0.926 0.915 0.927 3 =	3.10 6 0.928 0.920 0.921 A 31.52 6 0.948
RAKE NO.  1 3 5  M <sub>\infty</sub> =   \$\bar{p}_{t_2}\$  RAKE NO.  1	P <sub>t</sub> =   1   0.872   0.867   0.877   3.0   2   P <sub>t</sub> =   1   0.860   0.899	2 0.884 0.879 0.898 0.898	TUBE 3 0.898 0.891 0.915 α = 8 mb TUBE 3 0.885 0.900	$1/m_{\infty} =$ NO.  4  0.909  0.901  0.903 $1/m_{\infty} =$ NO.  4  0.892	0.050 5 0.915 0.923 0.923 0.0° 0.12 5 0.906 0.939	6 0.903 0.918 0.923 mo 23 Δ 6 0.898 0.896	$p_{t_2} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4	0.07 1 0.882 0.861 0.874 0.09	2 0.891 0.879 0.885 	TUBE 3 0.906 0.897 0.896 Exit  TUBE 3 0.891 0.879	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.920 0.903 0.910 setting p <sub>2</sub> /p NO.  4 0.907	5 0.926 0.915 0.927 3 = 5 0.916 0.904	3.10 6 0.928 0.920 0.921 A 31.52 6 0.948 0.892

$M_{\infty} =$	3.0	00	<u>α</u> =		2.0°	m <sub>O</sub>	/m <sub>∞</sub> = _		I	Exit se	etting	=	В
Ēt2	$p_{t_{\infty}} =$	0.893	<u> </u>	$_1/m_\infty =$	0.109	<u>)</u> Δ	p <sub>t2</sub> = -	0.104	<del>-</del>		$p_2/p_{\infty}$	<b>=</b> 3	1.31
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.862	0.879	0.882	0.889	0.899	0.889	2	0.875	0.893	0.889	0.904	0.906	0.943
3	0.901	0.884	0.898	0.917	0.928	0.893	14	0.851	0.863	0.866	0.887	0.896	0.883
5	0.875	0.870	0.873	0.888	0.885	0.880	6	0.897	0.904	0.931	0.926	0.937	0.913
M <sub>∞</sub> :	=3	.00	_ α =	2	2.0°	m <sub>O.</sub>	/m <sub>∞</sub> = .			Exit	setting	g =	C
$\bar{p}_{t_2}$	$/p_{t_{\infty}} =$	_0.88	7_ m <sub>b</sub>	$_1/m_\infty$ =	0.099	9Δ;	p <sub>t2</sub> = -	0.098	3		p <sub>2</sub> /p <sub>0</sub>	• = <u>31</u>	.08
RAKE			TUBE	NO.			RAKE			TUBE	NO.	-	
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.862	0.877	0.881	0.887	0.890	0.883	2	0.874	0.897	0.892	0.900	0.900	0.934
	0 807	0.875	0.891	0.908	0.917	0.883	4	0.847	0.858	0.860	0.880	0.884	0.869
3	0.091	1 - 1 /											
	0.869		0.866	0.879	0.872	0.866	6	0.892	0.898	0.930	0.924	0.931	0.908
5	0.869	0.864						0.892	<u> </u>				
5 M <sub>∞</sub> =	0.869	0.864 75	_ α =	: 2	2.0°	m <sub>C</sub>	/m <sub>∞</sub> =			Exit		g =	A
5 M <sub>∞</sub> =	0.869	0.864 75	_ α =	: 2	2.0°	m <sub>C</sub>	/m <sub>∞</sub> =			Exit	p <sub>2</sub> /p	g =	A
5 M <sub>∞</sub> = P̄t₂	0.869 = 2.' p <sub>t</sub> <sub>w</sub> =	0.864 75	α =  l mb  TUBE		0.12	_ m <sub>C</sub>	$/m_{\infty} =$ $p_{t_2} =$ RAKE		2	Exit :	p <sub>2</sub> /p <sub>0</sub>	z =	A 21.47
5 M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE	0.869 2.' /Pt <sub>w</sub> =	0.864 75 - 0.91	α =  l mb  TUBE	$\frac{1}{1}/m_{\infty} = \frac{2}{1}$	0.12		$/m_{\infty} =$ $p_{t_2} =$ RAKE NO.	0.092	2	Exit s	P <sub>2</sub> /P <sub>0</sub>	x =	A 21.47
5 M <sub>∞</sub> = P̄t₂ RAKE NO.	0.869 = 2.7 p <sub>t</sub> _ = 1 0.909	0.864 75 - 0.91	α =  1	$m_{\infty} = \frac{2}{1}$ No. 4 0.899	0.12 5 0.926		$m_{\infty} = 1$ $p_{t_2} = 1$ $p_{t_3} = 1$ $p_{t_3} = 1$	0.092	2 0.905	TUBE 3 0.888	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.921	5 0.936	A 21.47 6 0.933
5  M <sub>∞</sub> = $\overline{p}_{t_2}$ RAKE NO.   1	0.869 = 2.7 p <sub>t</sub> _ = 1 0.909	0.864 75	α =  1	$1/m_{\infty} = \frac{2}{1}$ NO. 4 0.899 0.939	0.12 5 0.926 0.945	m <sub>0</sub> 1 Δ 6 0.876 0.921	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO.$ $2$ $4$	0.092 1 0.893 0.871	2 0.905	TUBE 3 0.888 0.871	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.921 0.895	5 0.936 0.926	A 21.47 6 0.933 0.955
5  M <sub>∞</sub> =   \$\bar{p}_{t_2}\$  RAKE  NO.   1  3  5	0.869 = 2.7 p <sub>t</sub> <sub>w</sub> = 1 0.909 0.921 0.910	0.864 75 0.91 2 0.891 0.917 0.887	α =  1	$m_{\infty} = \frac{2}{1}$ No. 4 0.899 0.939	0.12 5 0.926 0.945 0.924	m <sub>0</sub> 1 Δ 6 0.876 0.921 0.911	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.092 1 0.893 0.871	2 0.905 0.881 0.913	TUBE 3 0.888 0.871 0.922	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.921 0.895 0.923	5 0.936 0.924	6 0.933 0.955 0.881
$M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$ RAKE NO.  1 3 5	0.869  - 2.7  - pt_ = 1  0.909  0.921  0.910  - 2.	0.864 75 - 0.91 2 0.891 0.917 0.887	α =  1	$\frac{1}{m_{\infty}} = \frac{2}{1}$ No. 4 0.899 0.939 0.918	0.12 5 0.926 0.945 0.924	m <sub>0</sub> 1 Δ 6 0.876 0.921 0.911 m <sub>0</sub>	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ . $2$ $4$ $6$ $/m_{\infty} =$	0.092 1 0.893 0.871 0.911	2 0.905 0.881 0.913	TUBE 3 0.888 0.871 0.922	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.921 0.895 0.923 settin	5 0.936 0.926 0.924	6 0.933 0.955 0.881
$5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE NO. $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE	0.869  - 2.7  - pt_ =  1  0.909  0.921  0.910  - 2.	0.864 75 - 0.91 2 0.891 0.917 0.887	α =  1	$\frac{1}{m_{\infty}} = \frac{2}{1}$ No. 4 0.899 0.939 0.918	0.12 5 0.926 0.945 0.924	m <sub>0</sub> 1 Δ 6 0.876 0.921 0.911 m <sub>0</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE RAKE	0.092 1 0.893 0.871 0.911	2 0.905 0.881 0.913	TUBE 3 0.888 0.871 0.922	setting $p_2/p_0$ NO. 4 0.921 0.895 0.923 setting	5 0.936 0.926 0.924	A 21.47 6 0.933 0.955 0.881 B
$\begin{array}{c} 5 \\ M_{\infty} = \\ \bar{p}_{t_2} \\ \\ RAKE \\ NO. \\ \\ 1 \\ 3 \\ 5 \\ \\ M_{\infty} = \\ \bar{p}_{t_2} \\ \end{array}$	0.869  - 2.7  - pt_ =  1  0.909  0.921  0.910  - 2.	0.864 75 - 0.91 2 0.891 0.917 0.887	α =  1	$\frac{1}{m_{\infty}} = \frac{2}{1000}$ $\frac{1}{m_{\infty}} = \frac{2}{1000}$ $\frac{1}{m_{\infty}} = \frac{2}{1000}$	0.12 5 0.926 0.945 0.924	m <sub>0</sub> 1 Δ 6 0.876 0.921 0.911 m <sub>0</sub>	$/m_{\infty} =$ $p_{t_2} =$ $RAKE$ $NO$ . $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_2} =$	0.092 1 0.893 0.871 0.911	2 0.905 0.881 0.913	TUBE 3 0.888 0.871 0.922 Exit	setting $p_2/p_0$ NO. 4 0.921 0.895 0.923 setting	5 0.936 0.926 0.924	A 21.47 6 0.933 0.955 0.881 B
$5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE NO. $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t_2}$ RAKE	0.869  - 2.7  - pt_ = 1  0.909  0.921  0.910  - 2.  - pt_ = 1	0.864 75 0.91 2 0.891 0.917 0.887 75	α =  1	$ \begin{array}{c}                                     $	0.12 5 0.926 0.945 0.924 .0°	m <sub>0</sub> 6  0.876  0.921  0.911  m <sub>0</sub> Δ	$m_{\infty} = \frac{1}{2}$	0.092 1 0.893 0.871 0.911 	2 0.905 0.881 0.913	TUBE 3 0.888 0.871 0.922 Exit	NO. $4$ 0.921 0.895 0.923 settin	5 0.936 0.926 0.924 g =	6 0.933 0.955 0.881 B 21.38
5  M <sub>∞</sub> = $\bar{p}_{t_2}$ RAKE NO.  1  3  5  M <sub>∞</sub> = $\bar{p}_{t_2}$	0.869  = 2.7  pt_w =   1 0.909 0.921 0.910  = 2.  pt_w =   1 0.907	0.864 75 0.91 2 0.891 0.917 0.887 75 0.910	α =  1	$\frac{1}{m_{\infty}} = \frac{2}{1 \cdot m_{\infty}}$ 0.899 0.939 0.918 $\frac{2}{1 \cdot m_{\infty}} = \frac{2}{1 \cdot m_{\infty}}$ NO. 4 0.895	0.12 5 0.926 0.945 0.924 .0° - 0.11	m <sub>0</sub> 1 Δ 6 0.876 0.921 0.911 m <sub>0</sub> 2 Δ 6 0.886	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ RAKE  NO.	0.092 1 0.893 0.871 0.911 0.09	2 0.905 0.881 0.913	TUBE 3 0.888 0.871 0.922 Exit TUBE 3 0.890	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.921 0.895 0.923 settin P <sub>2</sub> /F NO.  4 0.919	5 0.936 0.926 0.924 8 =	6 0.933 0.955 0.881 B 21.38

M <sub>∞</sub> =	2.75	5	α =	2.0	)	_ m <sub>o</sub> /	′m <sub>∞</sub> = _		F	Exit se	etting	=	<u>;</u>
Φt2/	/p <sub>t</sub> =	0.903	m <sub>bl</sub>	$L/m_{\infty} =$	0.097	<u>Λ</u> Δ <u>r</u>	) <sub>t2</sub> = _	0.112	2		p <sub>2</sub> /p <sub>o</sub>	o = _21	.07
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	6
1	0.899	0.880	0.900	0.889	0.920	0.881	2	0.875	0.899	0.891	0.910	0.906	0.888
3	0.918	0.894	0.927	0.913	0.930	0.913	14	0.858	0.873	0.864	0.891	0.911	0.960
5	0.910	0.874	0.883	0.902	0.915	0.901	6	0.921	0.915	0.940	0.936	4.935	0.879
						m <sub>o</sub> /	,		I	Exit se	etting	= P	1
											,		
Pt <sub>2</sub> /	/p <sub>t∞</sub> =	0.930	) <b>m</b> b]	l/m∞ =	0.13	+ _ Δ <u>I</u>	)t2 = .	0.06			p <sub>2</sub> /p <sub>c</sub>	o = _14	+.88
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.917	0.903	0.928	0.917	0.941	0.922	2	0.905	0.919	0.910	0.942	0.950	0.953
3	0.939	0.939	0.940	0.936	0.944	0.912	4	0.897	0.910	0.926	0.942	0.944	0.958
5	0.941	0.916	0.931	0.931	0.933	0.916	6	0.926	0.927	0.946	0.953	0.954	0.929
			, ,	, , ,				/			)	9 7 7 7 .	2.727
				•	<u> </u>	m <sub>o/</sub>	<u>.                                    </u>	II	L	l			L
M <sub>∞</sub> =	2.50	)	_ α =	2.0	) <b>°</b>	m <sub>o</sub> ,	/ <sub>m∞</sub> = .		<b>_</b>	Exit s	etting	= <u>I</u>	3
M <sub>∞</sub> =	2.50	)	_ α =	2.0	) <b>°</b>	1	/ <sub>m∞</sub> = .		<b>_</b>	Exit s		= <u>I</u>	3
M <sub>∞</sub> =	2.50	)	_ α =	2.0 1/m <sub>∞</sub> =	) <b>°</b>	m <sub>o</sub> ,	/ <sub>m∞</sub> = .	0.10	<b>_</b>	Exit s	etting	= <u>I</u>	3
$M_{\infty} = \bar{p}_{t_2}$		0.92	α =  4 mb: TUBE	2.0 1/m <sub>∞</sub> =	0.112	m <sub>o/</sub>	/m <sub>∞</sub> = .	0.10	00	Exit so	etting	= <u>I</u>	3 +.63
$M_{\infty} = \bar{p}_{t_2}$		0.92	$\alpha = \frac{\alpha}{4} = \frac{m_{b}}{3}$ TUBE	$\frac{2.0}{1/m_{\infty}} = \frac{1}{NO}$	0.112 5	m <sub>o/</sub>	$m_{\infty} = \frac{1}{2}$ $RAKE$	0.10	2	Exit so	P <sub>2</sub> /P <sub>0</sub>	= <u>I</u> <sub>x</sub> = <u>1</u> <sub>5</sub>	6
$M_{\infty} = \bar{p}_{t_2}$ RAKE	2.50 /pt <sub>w</sub> =  1 0.915	0.92	$\alpha = \frac{\alpha}{4} = \frac{m_b}{1000}$ TUBE $\frac{3}{0.924}$	$2.0$ $1/m_{\infty} =$ NO. 4 0.912	0.112 5 0.933	m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.10	2 0.916	TUBE 3 0.909	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.947	= $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$	6 0.948
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	2.50 /pt <sub>w</sub> =  1 0.915 0.930	0.92 2 0.898 0.936	α =  4 m <sub>b</sub> :  TUBE  3 0.924 0.956	$2.0$ $1/m_{\infty} =$ NO. $4$ 0.912 0.935	0.112 5 0.933 0.940	m <sub>0</sub> , 2 Δ <sub>1</sub> 6 0.914	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.10	2 0.916 0.883	TUBE 3 0.909 0.911	P2/P, NO. 4 0.947 0.938	=	6 0.948 0.958
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	2.50 /pt <sub>w</sub> =  1 0.915 0.930	0.92 0.898 0.936 0.902	α =  4 mb:  TUBE  3 0.924 0.956 0.927	$2.0$ $1/m_{\infty} =$ NO. $4$ 0.912 0.935	0.112 5 0.933 0.940 0.920	m <sub>0</sub> / 2 Δ <sub>1</sub> 6 0.914 0.900 0.903	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.10 1 0.902 0.866	2 0.916 0.883 0.930	TUBE 3 0.909 0.911 0.947	P2/P, NO. 4 0.947 0.938	= I <sub>∞</sub> = 1 <sup>1</sup> 5  0.940  0.949  0.948	6 0.948 0.958 0.922
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3 $M_{\infty} = \overline{p}_{t,2}$	2.50 /pt <sub>w</sub> =  1 0.915 0.930 0.927 2.50	0.92 0.92 2 0.898 0.936 0.902	$\alpha = \frac{1}{4}$ $m_{b}$ TUBE  3 0.924 0.956 0.927 $\alpha = \frac{1}{4}$	$ \begin{array}{c} 2.0 \\ 1/m_{\infty} = \\ 0.912 \\ 0.935 \\ 0.919 \\ 2.0 \end{array} $	0.112 5 0.933 0.940 0.920	m <sub>0</sub> / 2 Δ <sub>1</sub> 6 0.914 0.900 0.903	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $\frac{1}{6}$	0.10 1 0.902 0.866 0.929	2 0.916 0.883 0.930	TUBE 3 0.909 0.911 0.947	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.947 0.938 0.946 etting	= I <sub>∞</sub> = 1 <sup>1</sup> 5  0.940  0.949  0.948	6 0.948 0.958 0.922
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3 $M_{\infty} = \overline{p}_{t,2}$	2.50 /pt <sub>w</sub> =  1 0.915 0.930 0.927 2.50	0.92 0.92 2 0.898 0.936 0.902	$\alpha = \frac{1}{4}$ $m_{b}$ TUBE  3 0.924 0.956 0.927 $\alpha = \frac{1}{4}$	$2.0$ $1/m_{\infty} =$ NO. $4$ 0.912 0.935 0.919 $2.0$ $1/m_{\infty} =$	0.112 5 0.933 0.940 0.920	m <sub>O</sub> / 2 Δ <sub>1</sub> 6 0.914 0.900 0.903	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$	0.10 1 0.902 0.866 0.929	2 0.916 0.883 0.930	TUBE 3 0.909 0.911 0.947	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.947 0.938 0.946 etting	= I	6 0.948 0.958 0.922
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	2.50 /pt <sub>w</sub> =  1 0.915 0.930 0.927 2.50	0.92 0.92 2 0.898 0.936 0.902	$\alpha = \frac{1}{4} - \frac{m_{b}}{m_{b}}$ TUBE  3  0.924  0.956  0.927 $\alpha = \frac{1}{2} - \frac{m_{b}}{m_{b}}$	$2.0$ $1/m_{\infty} =$ NO. $4$ 0.912 0.935 0.919 $2.0$ $1/m_{\infty} =$	0.112 5 0.933 0.940 0.920	m <sub>O</sub> / 2 Δ <sub>1</sub> 6 0.914 0.900 0.903	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $\frac{1}{6}$	0.10 1 0.902 0.866 0.929	2 0.916 0.883 0.930	TUBE 3 0.909 0.911 0.947 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.947 0.938 0.946 etting	= I	6 0.948 0.958 0.922
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	2.50 /p <sub>t</sub> = 1 0.915 0.930 0.927 2.50 /p <sub>t</sub> = 1	2 0.92 0.898 0.936 0.902	α =  4  mb:  TUBE  3  0.924  0.956  0.927  α =  0  mb:  TUBE  3	$2.0$ $1/m_{\infty} =$ NO.  4  0.912  0.935  0.919 $2.0$ $1/m_{\infty} =$ NO.  4	5 0.933 0.940 0.920 0.09 <sup>1</sup>	m <sub>o/</sub> Δ <sub>1</sub> 6  0.914  0.900  0.903  m <sub>o/</sub> Δ <sub>2</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.10 1 0.902 0.866 0.929 0.12	2 0.916 0.883 0.930	TUBE  3 0.909 0.911 0.947 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.947 0.938 0.946 etting P <sub>2</sub> /P <sub>0</sub> NO.  4	= I	6 0.948 0.958 0.922
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	2.50 /pt <sub>w</sub> =  1 0.915 0.930 0.927 2.50 /pt <sub>w</sub> =  1 0.910	0.92 0.92 0.898 0.936 0.902 0.920 2 0.892	α =  4  mb:  TUBE  3  0.924  0.956  0.927  α =  0  mb:  TUBE  3  0.922	$2.0$ $1/m_{\infty} =$ NO.  4  0.912  0.935  0.919 $2.0$ $1/m_{\infty} =$ NO.  4  0.909	0.112 5 0.933 0.940 0.920 0.094 5 0.927	m <sub>0</sub> / 2 Δ <sub>1</sub> 6 0.914 0.900 0.903 m <sub>0</sub> / 4 Δ <sub>2</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.10 1 0.902 0.866 0.929 0.12	2 0.916 0.883 0.930 	TUBE 3 0.909 0.911 0.947 Exit s TUBE 3 0.918	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.947 0.938 0.946 etting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.945	= I	6 0.948 0.958 0.922
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	2.50 /pt <sub>w</sub> =  1 0.915 0.930 0.927 2.50 /pt <sub>w</sub> =  1 0.910 0.917	0.92 0.898 0.936 0.902 0.920 2 0.892 0.924	α =  4  mb:  TUBE  3  0.924  0.956  0.927  α =  0  mb:  TUBE  3  0.922  0.951	$2.0$ $1/m_{\infty} =$ NO. $4$ 0.912 0.935 0.919 $2.0$ $1/m_{\infty} =$ NO. $4$ 0.909 0.948	0.112 5 0.933 0.940 0.920 0.09 <sup>1</sup> 5 0.927 0.949	m <sub>0</sub> / 2 Δ <sub>1</sub> 6 0.914 0.900 0.903 m <sub>0</sub> / 4 Δ <sub>1</sub>	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  4	0.10 1 0.902 0.866 0.929 0.12 1 0.901 0.846	2 0.916 0.883 0.930 	TUBE  3 0.909 0.911 0.947 Exit s  TUBE 3 0.918 0.898	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.947 0.938 0.946 etting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.945 0.935	= I	6 0.948 0.958 0.922 3 14.48 6 0.942

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\overline{p}_{t_2}/p_{t_\infty}$  - Continued (a) 1.50 D inlet with vortex generators

M <sub>∞</sub> =	2.25		_ α =	2.0	0	m <sub>o.</sub>	/m <sub>∞</sub> = .		1	Exit s	etting	= <u>A</u>	
p <sub>t2</sub>	/p <sub>t</sub> =	0.94	<u>l</u> mb.	l/m <sub>∞</sub> =	0.14	<u>7</u> ∆;	p <sub>t2</sub> = .	0.078			p <sub>2</sub> /p	∞ = <u> </u>	10.14
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.930	0.930	0.944	0.952	0.946	0.939	2	0.930	0.933	0.951	0.955	0.955	0.962
3	0.902	0.918	0.929	0.937	0.943	0.940	4		0.910	<del></del>		+	
5	0.927	0.928	0.942	0.944	0.952	0.950	6	T	0.942				
$M_{\infty} =$	2.25		_ α =	2.0°		m <sub>o</sub> ,			]				
	,												
Pt2	$/p_{t_{\infty}} =$	0.93	<u>6</u> ™b∃	$1/m_{\infty} =$	0.10	<u>8</u> ∆ <sub>1</sub>	p <sub>t2</sub> = .	0.097	<u>.                                    </u>		_ p <sub>2</sub> /p	<sub>∞</sub> =	9.95
RAKE		,	TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.927	0.921	0.943	0.950	0.934	0.925	2	0.920	0.926	0.949	0.954	0.947	0.963
3	0.885	0.904	0.928	0.945	0.952	0.953	4	В	0.896				
5	0.915	0.917	0.936	0.942	0.947	0.945	6		0.942				
M <sub>∞</sub> =	2.25		_ α =	2.0°		m <sub>o</sub> ,	/m <sub>∞</sub> =		I				
=	/												
Ptz	$/p_{t_{\infty}} =$	0.91	<u>9</u> mb]	l/m∞ =	0.09	<u>1</u> Δ	p <sub>t2</sub> = .	0.12	28		p <sub>2</sub> /p <sub>0</sub>	∞ <sup>=</sup>	9.77
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
_ 1	0.906	0.909	0.933	0.954	0.930	0.922	2	0.888	0.904	0.936	0.953	0.922	0.944
3	0.851	0.868	0.895	0.924	0.946	0.956	4	H .	0.861				
5	0.870	0.882	0.911	0.936	0.936	0.955	6	5	0.925		[		
$M_{\infty} =$	2.00										etting		
ē <sub>t2</sub>	$/p_{t_{\infty}} =$	0.92	ı m <sub>b</sub> j	$_{\rm L}/{\rm m}_{\infty}$ =							p <sub>2</sub> /p,	<sub>∞</sub> =(	6.63
RAKE			TUBE	NO.	·		DAVE			TUBE			
NO.	1	2	3	4	5	6	RAKE NO.	1	2	3	NO.	5	6
1	0.907		0.947				2						
3			0.899						0.893 0.889				
<b>├</b> ─ <u></u>					2.0/3	J - J J -	т т	12.000	J • OO7	~ · / 1 C	V • 7CU	マ・フラント	<b>ン・ソム</b> ひ
5	01	امیہا	0.933			l			0.933				

$M_{\infty} =$	2.00	)	<u>α</u> =	2.0	) °	_ m <sub>o</sub> /	′m <sub>∞</sub> = _		F	Exit se	etting	= <u>B</u>	·
$ar{p}_{ extsf{t}_{2'}}$	$/p_{t_{\infty}} =$	0.92	o m <sub>b</sub> ]	$L/m_{\infty} =$	0.08	β <u>3</u> Δι	o <sub>t2</sub> = _	0.0	88		p <sub>2</sub> /p <sub>c</sub>	<sub>o</sub> = _6	5.10
RAKE			TUBE	NO.	-		RAKE			TUBE	NO.	·	
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.912	0.926	0.947	0.945	0.929	0.910	2	0.895	0.903	0.927	0.956	0.935	0.946
3	0.880	0.891	0.896	0.900	0.902	0.896	4	0.875	0.883	0.907	0.906	0.922	0.918
5	0.907	0.915	0.937	0.929	0.934	0.925	6	0.935	0.947	0.955	0.949	0.948	0.950
M <sub>∞</sub> =						m <sub>o</sub> /							
Pt2	/p <sub>t∞</sub> =	0.92	8_ m <sub>b</sub>	l/m <sub>∞</sub> =	0.0	79 △ <u>r</u>	) <sub>t2</sub> = .	0.100	)		. p <sub>2</sub> /p	× = _6	5.59
RAKE			TUBE	NO.		•	RAKE			TUBE	NO.		]
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.919	0.917	0.945	0.954	0.935	0.925	2	0.920	0.924	0.950	0.949	0.942	0.954
3	0.873	0.888	0.904	0.922	0.931	0.936	4	0.871	0.884	0.899	0.915	0.929	0.940
1 - 1	0 007	0.001	0 010	0 031	مراه م	0.932	6	0.933	0 011	055	0.058	060	0.063
5	0.907	0.924	0.942	0.934	0.942	0.932		0.933	0.944	0.977	0.990	0.902	0.903
		<del></del>		<b></b>		•		•		•		·	
M <sub>∞</sub> =	1.7	5	α =	2.0	o <b>°</b>	m <sub>o/</sub> Δ <sub>1</sub>	$m_{\infty} = 1$		]	Exit s	etting	·	
$M_{\infty} = \bar{p}_{t_{2}}$	1.7	5	α = 5_ mb:	$\frac{2.0}{1/m_{\infty}} =$	o <b>°</b>	m <sub>o</sub> /	/m <sub>∞</sub> = o <sub>t2</sub> =		]	Exit s	etting P <sub>2</sub> /P	= _ A	
M <sub>∞</sub> =	<u> </u>	0.94	α = 5 mb: TUBE	$\frac{2.0}{1/m_{\infty}} =$	0.1	m <sub>o</sub> ,	$m_{\infty} = 1$	0.06	6	Exit so	etting p <sub>2</sub> /p <sub>0</sub>	= _ A	+.64
$M_{\infty} = \bar{p}_{t,2}$ RAKE	1.7 /p <sub>t<sub>∞</sub></sub> =	5 0.94 2	α = 5 _ m <sub>b</sub> : TUBE	$\frac{2.0}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO.	0.1	m <sub>o</sub> ,	$m_{\infty} = 0$	0.06	6 2	Exit so	P <sub>2</sub> /P <sub>0</sub>	= A	+.64
$M_{\infty} = \bar{p}_{t,2}$ RAKE	1.7 /pt <sub>w</sub> =	5 0.94 2 0.946	$\alpha = \frac{1}{2} m_b$ TUBE $\frac{1}{2} 0.952$	$2.0$ $1/m_{\infty} = $ NO. 4 0.967	0.1 5 0.957	m <sub>o</sub> ,	$m_{\infty} = 0$ $m_{\infty$	0.06	2 0.950	TUBE  3 0.966	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967	$= A$ $\infty = A$ $\infty = A$	6 0.951
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	1.7 /pt <sub>w</sub> =  1 0.942 0.931	0.94 2 0.946 0.944	α = 5 mb: TUBE 3 0.952 0.949	$2.0$ $1/m_{\infty} =$ NO. 4 0.967 0.948	0.1 5 0.957 0.938	m <sub>0</sub> / 12 Δ <sub>1</sub> 6 0.945	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.06 1 0.942 0.929	2 0.950 0.932	TUBE 3 0.966 0.932	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.927	$= A$ $\infty = 1$ $0.956$	6 0.951 0.905
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1 3	1.7 /pt <sub>w</sub> =  1 0.942 0.931 0.948	0.94 2 0.946 0.944 0.947	α = 5 mb: TUBE 3 0.952 0.949 0.955	$2.0$ $1/m_{\infty} =$ NO. 4 0.967 0.948	0.1 5 0.957 0.938 0.941	m <sub>0</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.06 1 0.942 0.929 0.947	2 0.950 0.932 0.952	TUBE 3 0.966 0.932 0.963	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.927 0.968	= A = 1 5 0.956 0.917	6 0.951 0.905 0.958
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3 $M_{\infty} = \bar{p}_{t,2}$	1.7 /Pt <sub>w</sub> =  1 0.942 0.931 0.948 1.7	0.94 2 0.946 0.944 0.947	α = 5 mb: TUBE 3 0.952 0.949 0.955 α =	$ \begin{array}{c} 2.0 \\ 1/m_{\infty} = \\ NO. \\ 4 \\ 0.967 \\ 0.948 \\ 0.934 \\ 2.0 \end{array} $	0.1 5 0.957 0.938 0.941	m <sub>0</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.06 1 0.942 0.929	2 0.950 0.932 0.952	TUBE 3 0.966 0.932 0.963	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.927 0.968 etting	= A = 1 5 0.956 0.917 0.962	6 0.951 0.905 0.958
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3 $M_{\infty} = \bar{p}_{t,2}$	1.7 /Pt <sub>w</sub> =  1 0.942 0.931 0.948 1.7	0.94 2 0.946 0.944 0.947	α = 5 mb: TUBE 3 0.952 0.949 0.955 α =	$ \begin{array}{c} 2.0 \\ 1/m_{\infty} = \\ NO. \\ 4 \\ 0.967 \\ 0.948 \\ 0.934 \\ 2.0 \\ 1/m_{\infty} = \\ \end{array} $	0.1 5 0.957 0.938 0.941	m <sub>o</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.06 1 0.942 0.929	2 0.950 0.932 0.952	TUBE 3 0.966 0.932 0.963	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.927 0.968 etting P <sub>2</sub> /P <sub>0</sub>	= A = 1 5 0.956 0.917 0.962 = B	6 0.951 0.905 0.958
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3 $\bar{p}_{t,2}$	1.7 /Pt <sub>w</sub> =  1 0.942 0.931 0.948 1.7	0.94 2 0.946 0.944 0.947	$\alpha = \frac{1}{2} \alpha = $	$ \begin{array}{c} 2.0 \\ 1/m_{\infty} = \\ NO. \\ 4 \\ 0.967 \\ 0.948 \\ 0.934 \\ 2.0 \\ 1/m_{\infty} = \\ \end{array} $	0.1 5 0.957 0.938 0.941	m <sub>o</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\mu$ $m_{\infty} = \frac{1}{2}$	0.06 1 0.942 0.929	2 0.950 0.932 0.952	TUBE 3 0.966 0.932 0.963 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.927 0.968 etting P <sub>2</sub> /P <sub>0</sub>	= A = 1 5 0.956 0.917 0.962 = B	6 0.951 0.905 0.958
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t,2}$ RAKE	1.7 /Pt <sub>w</sub> =  1 0.942 0.931 0.948  1.7 /Pt <sub>w</sub> =	2 0.946 0.944 0.947 5 0.94	α = 5  mb: TUBE 3 0.952 0.949 0.955 α = 4  mb: TUBE 3	$2.0$ $1/m_{\infty} =$ NO.  4  0.967  0.948  0.934  2.0 $1/m_{\infty} =$ NO.  4	5 0.957 0.938 0.941 0.08	m <sub>o</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922 m <sub>o</sub> / 4 Δ <sub>1</sub>	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE	0.06 1 0.942 0.929 0.947 0.070	2 0.950 0.952 0.952	TUBE 3 0.966 0.932 0.963 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.967 0.927 0.968 etting P <sub>2</sub> /P <sub>0</sub> NO.  4		6 0.951 0.905 0.958
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	1.7 /pt <sub>w</sub> =  1 0.942 0.931 0.948  1.7 /pt <sub>w</sub> =	2 0.946 0.944 0.947 5 0.94 2 0.942	α = 5  mb: TUBE 3 0.952 0.949 0.955 α = 4  mb: TUBE 3 0.958	$2.0$ $1/m_{\infty} =$ NO.  4  0.967  0.948  0.934  2.0 $1/m_{\infty} =$ NO.  4	5 0.957 0.938 0.941 0.08	m <sub>o</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922 m <sub>o</sub> / 4 Δ <sub>1</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.06 1 0.942 0.929 0.947 0.070	2 0.950 0.932 0.952	TUBE 3 0.966 0.932 0.963 Exit so TUBE 3 0.965	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.927 0.968 etting P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967		6 0.951 0.905 0.958 •57 6 0.956
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1	1.7  /Pt <sub>w</sub> =  1 0.942 0.931 0.948  1.7  /Pt <sub>w</sub> =  1 0.932 0.914	0.94  0.946  0.947  5  0.94  0.942  0.925	α = 5  mb: TUBE 3 0.952 0.949 0.955 α = 4  mb: TUBE 3 0.958 0.935	$ \begin{array}{c} 2.0 \\ 1/m_{\infty} = \\ NO. \\ 4 \\ 0.967 \\ 0.948 \\ 0.934 \\ 2.0 \\ 1/m_{\infty} = \\ NO. \\ 4 \\ 0.977 \\ 0.941 \end{array} $	0.1 5 0.957 0.938 0.941 0.08 5 0.949 0.940	m <sub>o</sub> / 12 Δ <sub>1</sub> 6 0.945 0.924 0.922 m <sub>o</sub> / 4 Δ <sub>1</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.  2  RAKE NO.  2	0.06 1 0.942 0.929 0.947 0.070 1 0.938 0.910	2 0.950 0.952 0.952 - 2 0.939 0.919	TUBE 3 0.966 0.932 0.963 Exit s TUBE 3 0.965 0.936	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.968 etting P <sub>2</sub> /P <sub>0</sub> NO. 4 0.967 0.941	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	6 0.951 0.905 0.958 •57 6 0.956

$M_{\infty} =$	1.75	<u> </u>	<u>α</u> =	2.0	) <b>°</b>	m <sub>o</sub> ,	$m_{\infty} = 1$		· 1	Exit s	etting	=	;
	/p <sub>t∞</sub> =	0.930		L/m <sub>∞</sub> =	0.083	3 <u> </u>	ot2 = .	0.106	5		p <sub>2</sub> /p	<sub>∞</sub> = <u>1</u>	+.50
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6		1	2	Γ"	1	5	6
1	0.958	0.970	0.970	0.935	0.905	0.875	2	0.966	0.964	0.946	0.918	0.912	0.912
3	0.945	0.933	0.920	0.920	0.900	0.913	4	0.938	0.933	0.929	0.924	0.924	0.924
5	0.951	0.948	0.925	0.902	0.905	0.908						0.911	
M <sub>∞</sub> =	1.5	5	<u>α</u> =	2.0	) <b>°</b>	m <sub>o</sub> /	$m_{\infty} = 1$		1	Exit s	etting	=	1
	,												
₱t <sub>2</sub> /	$/p_{t_{\infty}} =$	0.966	<u>m</u> b1	$L/m_{\infty} =$	0.120		)t2 = .	0.05	54		. p <sub>2</sub> /p	<sub>∞</sub> =3	B•57
RAKE			TUBE	NO.	· · · · · ·		RAKE			TUBE	NO.	•	
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.991	0.988	0.978	0.964	0.952	0.942	2	0.994	0.975	0.965	0.959	0.961	0.962
3	0.964	0.965	0.961	0.964	0.963	0.965	4	0.959	0.960	0.962	0.965	0.968	0.968
5	0.966	0.970	0.965	0.942	0.959	0.951	6	0.983	0.978	0.962	0.960	0.962	0.963
M <sub>∞</sub> =	1.55	5	α =	2.0	•	m	/m <sub>∞</sub> =		_ ]	Exit s	etting	= I	3
$\mathtt{p}_{t_{2'}}$	$/p_{t_{\infty}} =$	0.96	<u> </u>	$L/m_{\infty} =$	0.08	$\frac{38}{2}$	Pt2 = .	0.06	51		_ p <sub>2</sub> /p	∞ = <u> </u>	3 • 53
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	· 6			2	3	4	5	6
1	0.989	0.988	0.981	0.966	0.950	0.932	2	0.991	0.976	0.964	0.960	0.962	0.963
3	0.966	0.964	0.961	0.964	0.963	0.965	4	0.960	0.960	0.963	0.965	0.967	0.967
5	0.967	0.972	0.964	0.943	0.956	0.951	6	0.988	0.979	0.962	0.961	0.962	0.963
M <sub>∞</sub> =	1.55	5	α =	2.0	) <b>°</b>	m <sub>O</sub> /	/ <sub>m</sub> = .		]	Exit s	etting	= _ (	;
⊽ <sub>t≥′</sub>	/ <sub>Pt_</sub> =	0.965	5 m <sub>b</sub> :	$_{\rm L}/{\rm m}_{\infty} =$	0.0	<b>7</b> 7 △1	Pt2 =	0.069	5		p <sub>2</sub> /p	∞ = <u>_</u> 3	3.51
						_ <del></del> _		T					
RAKE NO.	1		TUBE				RAKE NO.			TUBE	T		
		2	3	4	5	6		1	2	3	4	5	6
1			0.984				2					0.963	
3			0.962				4			-		0.968	
5	0.969	0.973	0.963	0.943	0.955	0.951	6	0.989	0.982	0.963	0.963	0.963	0.964

M <sub>∞</sub> =	3.00	)	_ α =	5.0°	·	_ <sup>m</sup> o/	′m <sub>∞</sub> = _	-	F	Exit se	etting	=A	
₽ <sub>t2′</sub>	/p <sub>t∞</sub> =	0.799	mb]	L/m <sub>∞</sub> =	0.09	8 <u></u> Δ1	) <sub>t2</sub> = _	0.20	8		p <sub>2</sub> /p <sub>o</sub>	o = _2	8.30_
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1_	2	3	4	5	6		1	2	3	4	5	6
l	0.781	0.806	0.829	0.842	0.857	0.846	2	0.780	0.808	0.847	0.863	0.887	0.836
3	0.803	0.805	0.793	0.771	0.748	0.735	4	0.778	0.766	0.743	0.735	0 <b>.7</b> 24	0.721
5	0.804	0.791	0.775	0.763	0.745	0.733	6	0.800	0.835	0.868	0.862	0.861	0.822
									H	Exit se	etting	= B	3
								0.20					
RAKE			TUBE				RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.780	0.804	0.830	0.842	0.855	0.843	2	0.753	0.780	0.816	0.853	0.887	0.844
3	0.721	0.729	0.754	0.777	0.800	0.804	4	0.724	0.741	0.765	0.791	0.806	0.797
	0 500	0 -(0		- 0			_		0.1	- 000	0 0 0 0 0	_	
_ 5		<del></del>		<u> </u>		0.786						0.857	
M <sub>∞</sub> =	3.00	)	α =	5•0	) <b>°</b>	m <sub>o</sub> ,	$m_{\infty} = 1$	0.770	I	Exit s	etting	= <u>C</u>	;
M <sub>∞</sub> =	3.00	)	α =		) <b>°</b>	m <sub>O</sub> /	$m_{\infty} = 1$		I	Exit s	etting	= <u>C</u>	;
$M_{\infty} = \bar{p}_{t_2}$	$\frac{3.00}{p_{t_{\infty}}} =$	)	α = 3 mb: TUBE		0.091	m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE		I	Exit s	P <sub>2</sub> /P <sub>0</sub>	= <u>C</u>	27.87
$M_{\infty} = \bar{p}_{t_2}$	3.00 /pt_ =	0.793	α = 3 mb: TUBE 3		0.092	m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.25	I	Exit so	P <sub>2</sub> /P <sub>0</sub>	= 0 = 2	27.87 6
$M_{\infty} = \bar{p}_{t_2}$ RAKE	3.00 /pt_w =	0.793	$\alpha = \frac{3}{3}$ mb: TUBE 3 0.836	5.0 1/m <sub>∞</sub> = NO. 14 0.844	0.091 5 0.852	m <sub>O</sub> , Δ <sub>1</sub> 6 0.841	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.25	2 0.768	TUBE 3 0.813	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.852	= 0 = 2 = 2 5 0.875	6
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	3.00 /Pt <sub>w</sub> =  1 0.799 0.708	0.793 2 0.817	$\alpha = \frac{\alpha}{3}$ mb: TUBE 3 0.836 0.737	5.0 1/m <sub>∞</sub> = NO. 4 0.844 0.770	0.091 5 0.852 0.813	m <sub>o</sub> ,Δ <sub>1</sub> 60.8410.836	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.25	2 0.768 0.712	TUBE 3 0.813	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.852 0.755	= 0 = 2 5 0.875 0.787	6 0.907 0.809
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	3.00 /Pt <sub>∞</sub> =  1 0.799 0.708 0.704	0.793 2 0.817 0.712 0.712	$\alpha = \frac{1}{3}$ mb:  TUBE  3 0.836 0.737 0.734	5.0 1/m <sub>∞</sub> = NO. 14 0.844 0.770 0.761	5 0.852 0.813 0.800	m <sub>o</sub> , Δ 6 0.841 0.836 0.828	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.25 1 0.740 0.704	2 0.768 0.712 0.780	TUBE 3 0.813 0.726 0.832	P <sub>2</sub> /P <sub>6</sub> NO. 4 0.852 0.755 0.882	= 0 = 2 5 0.875 0.787 0.899	6 0.907 0.809 0.851
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	$3.00$ $/P_{t_{\infty}} =$ $1$ $0.799$ $0.708$ $0.704$	0.793 2 0.817 0.712 0.712	$\alpha = \frac{\alpha}{3}  \text{mb}$ TUBE $\frac{3}{0.836}$ $0.737$ $0.734$ $\alpha = \frac{\alpha}{3}$	5.0 1/m <sub>∞</sub> = NO. 4 0.844 0.770 0.761 5.0	5 0.852 0.813 0.800	6 0.841 0.836 0.828	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$	0.25 1 0.740 0.704 0.743	2 0.768 0.712 0.780	TUBE 3 0.813 0.726 0.832 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.852 0.755 0.882 etting	= 0 = 2 5 0.875 0.787 0.899	6 0.907 0.809 0.851
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	$3.00$ $/P_{t_{\infty}} =$ $1$ $0.799$ $0.708$ $0.704$	0.793 2 0.817 0.712 0.712	$\alpha = \frac{\alpha}{3}  \text{mb}$ TUBE $\frac{3}{0.836}$ $0.737$ $0.734$ $\alpha = \frac{\alpha}{3}$	$5.0$ $1/m_{\infty} = $ NO. $4$ 0.844 0.770 0.761 $5.0$	5 0.852 0.813 0.800	6 0.841 0.836 0.828	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$	0.25 1 0.740 0.704 0.743	2 0.768 0.712 0.780	TUBE 3 0.813 0.726 0.832 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.852 0.755 0.882 etting	= 0 = 2 5 0.875 0.787 0.899	6 0.907 0.809 0.851
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$	$3.00$ $p_{t_{\infty}} = 1$ $0.799$ $0.708$ $0.704$	0.793 2 0.817 0.712 0.712	$\alpha = \frac{1}{3}$	$5.0$ $1/m_{\infty} = $ NO. $4$ 0.844 0.770 0.761 $5.0$	5 0.852 0.813 0.800	6 0.841 0.836 0.828	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $6$ $m_{\infty} = \frac{1}{2}$	0.25 1 0.740 0.704 0.743	2 0.768 0.712 0.780	TUBE 3 0.813 0.726 0.832 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.852 0.755 0.882 etting	= 0 = 2 5 0.875 0.787 0.899 = A	6 0.907 0.809 0.851
$M_{\infty} = \bar{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	3.00 /pt <sub>w</sub> =  1 0.799 0.704	0.793 2 0.817 0.712 0.712 5	$\alpha = \frac{1}{3}$ $\frac{1}{3}$	$5.0$ $1/m_{\infty} = $ $1/m_{\infty} = $ $0.844$ $0.770$ $0.761$ $5.0$ $1/m_{\infty} = $ $1/m_{\infty} = $	5 0.852 0.813 0.800	6 0.841 0.836 0.828	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$ $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.25 1 0.740 0.704 0.743 0.15	2 0.768 0.712 0.780	TUBE  3 0.813 0.726 0.832 Exit s  TUBE  3	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.852 0.755 0.882 etting P <sub>2</sub> /P <sub>0</sub> NO.  4	= 0 = 2 5 0.875 0.787 0.899 = A = 1	6 0.907 0.809 0.851
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	$3.00$ $p_{t_{\infty}} = 1$ $0.799$ $0.708$ $0.704$ $2.70$ $p_{t_{\infty}} = 1$ $0.826$	0.793 2 0.817 0.712 0.712 5	$\alpha = \frac{3}{3}$ $m_b$ :  TUBE  3 0.836 0.737 0.734 $\alpha = \frac{3}{3}$ $m_b$ :  TUBE 3 0.854	$5.0$ $1/m_{\infty} = $ $1/m_{\infty} = $ $0.844$ $0.770$ $0.761$ $5.0$ $1/m_{\infty} = $ $1/m_{\infty} = $ $1/m_{\infty} = $	5 0.852 0.813 0.800 0.11	6 0.841 0.836 0.828 mo 1	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.25 1 0.740 0.704 0.743 0.15	2 0.768 0.712 0.780 -	TUBE 3 0.813 0.726 0.832 Exit s TUBE 3 0.836	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.852 0.755 0.882 etting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.855	= 0	6 0.907 0.809 0.851 4 19.23 6 0.875
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1	3.00  /Pt <sub>w</sub> =  1  0.799  0.704  2.70  /Pt <sub>w</sub> =  1  0.826  0.754	0.793 2 0.817 0.712 0.712 5 0.813	α = 3  mb: TUBE 3 0.836 0.737 0.734 α = 3  mb: TUBE 3 0.854 0.781	$5.0$ $1/m_{\infty} = $ $1/m_{\infty} = $ $0.844$ $0.770$ $0.761$ $5.0$ $1/m_{\infty} = $ $1/m_{\infty} = $ $1/m_{\infty} = $ $1/m_{\infty} = $	5 0.852 0.813 0.800 0.11 5 0.832 0.824	- m <sub>o</sub> / 6 0.841 0.836 0.828 - m <sub>o</sub> / 11 Δ: 6 0.812 0.821	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4	0.25 1 0.740 0.704 0.743 0.15 1 0.788 0.748	2 0.768 0.712 0.780 - 3 57 2 0.810 0.759	TUBE 3 0.813 0.726 0.832 Exit s  TUBE 3 0.836 0.768	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.852 0.755 0.882 etting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.855 0.788	$=$ 0 $\infty$ $=$ 2 $\infty$ $=$ 2 $\infty$ $=$ 2 $\infty$ $=$ 2 $\infty$ $=$ 3	6 0.907 0.809 0.851 4 19.23 6 0.875

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\overline{p}_{t_2}/p_{t_\infty}$  - Continued (a) 1.50 D inlet with vortex generators

M <sub>∞</sub> =	2.75	<u> </u>	_ a =	5 <b>.</b> 0'	·	_ m <sub>o</sub> /	$m_{\infty} = 1$		F	Exit se	etting	= <u> </u>	3
	/p <sub>t∞</sub> =	0.809	<u>m</u> b	_/m <sub>∞</sub> =	0.103	<u> </u>	o <sub>t2</sub> = .	0.19	9		p <sub>2</sub> /p <sub>c</sub>	× =	9.00
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.823	0.844	0.862	0.838	0.826	0.806	2	0.777	0.800	0.829	0.850	0.881	0.887
3	0.736	0.753	0.778	0.803	0.830	0.836	4	0.727	0.737	0.756	0.781	0.811	0.811
_ 5	0.736	0.747	0.771	0.794	0.820	0.831	6	0.786	0.809	0.836	0.861	0.878	0.870
M <sub>∞</sub> =	2.79	5	<u>α</u> =	5.0	•	m <sub>o</sub> /	/m <sub>∞</sub> = _		I	Exit se	etting	= <u>C</u>	
<u>5</u> +	/p <sub>t</sub> =	0.80	> m <sub>2</sub> -	/m =	0.089	) ^r	). <del>=</del>	0.232	)		n /n	_ 1	8 78
	<sup>'</sup> ∞						't2	· · · · · ·	- 		. 12/10	» ¯ — ¯	0.10
RAKE			TUBE			Γ"	RAKE			TUBE	NO.	<b> </b>	
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.816	0.841	0.865	0.842	0.820	0.796	2	0.771	0.792	0.823	0.853	0.885	0 <b>.8</b> 96
3	0.721	0.734	0.759	0.790	0.826	0.841	4	0.709	0.721	0.741	0.765	0.802	0.809
5	0.720	0.732	0.754	0.782	0.814	0.835	6	0.775	0.800	0.832	0.862	0.883	0.869
$M_{\infty} =$	2.50	)	<u> </u>	5.0	) <b>°</b>	m <sub>o</sub> /	$m_{\infty} = 1$		· I	Exit s	etting	= _A	
Ptz	/ Pt∞ =	0.82	<u> </u>	[/∞	0.12.	<u>ر</u> ت ا							
RAKE							/t2	0.172			_ p <sub>2</sub> / p <sub>c</sub>	» = _]	L3•37
NO.			TUBE				RAKE	i		TUBE		<sub>∞</sub> =]	<u>3.37</u>
110.		2	TUBE	NO.			i			TUBE	NO.	<sub>∞</sub> =]	
1	1			NO.	5	6	RAKE NO.		2	TUBE	NO.	5	6
	1 0.833	0.852	3	NO. 4	5 0.890	6 0.887	RAKE NO.	1	2	TUBE 3 0.840	NO. 4 0.856	5 0.878	6 0.876
1	1 0.833 0.766	0.852 0.773	3 0.867	NO. 4 0.885 0.797	5 0.890 0.811	6 0.887 0.813	RAKE NO. 2	1	2 0.824 0.768	TUBE 3 0.840 0.779	NO. 4 0.856 0.792	5 0.878 0.807	6 0.876 0.800
1 3 5	1 0.833 0.766	0.852 0.773 0.775	3 0.867 0.784 0.789	NO. 4 0.885 0.797 0.802	5 0.890 0.811 0.823	6 0.887 0.813 0.824	RAKE NO.	1 0.813 0.760	2 0.824 0.768 0.825	TUBE 3 0.840 0.779 0.852	NO. 4 0.856 0.792 0.883	5 0.878 0.807 0.897	6 0.876 0.800
1 3 5 M <sub>∞</sub> =	1 0.833 0.766 0.767	0.852 0.773 0.775	3 0.867 0.784 0.789 α =	NO. 4 0.885 0.797 0.802 5.0°	5 0.890 0.811 0.823	6 0.887 0.813 0.824	RAKE NO.  2  4  6  /m <sub>∞</sub> =	1 0.813 0.760 0.812	2 0.824 0.768 0.825	TUBE 3 0.840 0.779 0.852	NO. 4 0.856 0.792 0.883	5 0.878 0.807 0.897	6 0.876 0.800 0.902
1 3 5 M <sub>∞</sub> =	0.833 0.766 0.767	0.852 0.773 0.775	3 0.867 0.784 0.789 α =	NO.  4  0.885  0.797  0.802 $5.0^{\circ}$ $1/m_{\infty} =$	5 0.890 0.811 0.823	6 0.887 0.813 0.824	RAKE NO.  2  4  6  /m <sub>∞</sub> =	1 0.813 0.760 0.812	2 0.824 0.768 0.825	TUBE 3 0.840 0.779 0.852	NO. 4 0.856 0.792 0.883 etting	5 0.878 0.807 0.897 = B	6 0.876 0.800 0.902
1 3 5 M <sub>∞</sub> =	0.833 0.766 0.767	0.852 0.773 0.775	3 0.867 0.784 0.789 α =	NO.  4  0.885  0.797  0.802 $5.0^{\circ}$ $1/m_{\infty} =$	5 0.890 0.811 0.823	6 0.887 0.813 0.824	RAKE NO.  2  4  6  /m <sub>∞</sub> =	1 0.813 0.760 0.812	2 0.824 0.768 0.825	TUBE 3 0.840 0.779 0.852 Exit se	NO. 4 0.856 0.792 0.883 etting	5 0.878 0.807 0.897 = B	6 0.876 0.800 0.902
$\begin{array}{c} 1 \\ 3 \\ 5 \\ M_{\infty} = \\ \bar{p}_{t,2} \\ \end{array}$ RAKE	1 0.833 0.766 0.767 2.5 /pt =	0.852 0.773 0.775 50 0.828	3 0.867 0.784 0.789 α = 3 mb:	NO.  4  0.885  0.797  0.802 $5.0^{\circ}$ $1/m_{\infty} =$ NO.  4	5 0.890 0.811 0.823	6 0.887 0.813 0.824 m <sub>o</sub> ,	RAKE NO.	0.813 0.760 0.812 0.19	2 0.824 0.768 0.825 - 1	TUBE 3 0.840 0.779 0.852 Exit so TUBE 3	NO.  4 0.856 0.792 0.883 etting P <sub>2</sub> /P <sub>0</sub> NO. 4	5 0.878 0.807 0.897 = B	6 0.876 0.800 0.902
$\begin{array}{c} 1 \\ 3 \\ 5 \\ M_{\infty} = \\ \overline{p}_{t,2} \\ \end{array}$ RAKE NO.	1 0.833 0.766 0.767 2.5 /pt_w =	0.852 0.773 0.775 50 0.828 2	3 0.867 0.784 0.789 α = 3 m <sub>b</sub> : TUBE	NO.  4  0.885  0.797  0.802 $5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.889	5 0.890 0.811 0.823 0.107 5 0.879	6 0.887 0.813 0.824 m <sub>o</sub> / 7 6 0.875	RAKE NO.  2  4  6  /m <sub>∞</sub> =  Pt <sub>2</sub> =  RAKE NO.  2	0.813 0.760 0.812 0.19	2 0.824 0.768 0.825 - 1	TUBE 3 0.840 0.779 0.852 Exit services TUBE 3 0.845	NO.  4  0.856  0.792  0.883  etting  P <sub>2</sub> /P <sub>0</sub> NO.  4  0.868	5 0.878 0.807 0.897 = B =	6 0.876 0.800 0.902 -3.28 6 0.898

M <sub>∞</sub> =	2.50		_ α =	5.0	o	_ m <sub>o</sub> /	m <sub>∞</sub> = _		E	Sxit s€	etting	= <u>C</u>	
̄p <sub>t₂</sub> /	$p_{t_{\infty}} =$	0.823	m <sub>bl</sub>	/m <sub>∞</sub> =	0.09	<u>3</u> Δp	t2 = _	0.210			p <sub>2</sub> /p <sub>o</sub>	, = _1	3.12
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3		5	6	NO.	1	2	3	14	5	6
1	0.836	0.853	0.868	0.889	0.874	0.867	2	0.804	0.815	0.841	0.866	0.892	0.905
3	0.742	0.750	0.774	0.804	0.832	0.848	4	0.732	0.745	0.761	0.783	0.801	0.804
5								0.804	0.821	0.863	0.901	0.901	0.895
-													
₽t2′	$/p_{t_{\infty}} =$	0.86	<u>57</u> m <sub>b</sub> ]	$L/m_{\infty} =$	0.13	- <u>-</u> ∠r	)t <sub>2</sub> = .	0.1	.59		. p <sub>2</sub> /p <sub>0</sub>	° =	9.38
RAKE		,	TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.896	0.899	0.903	0.916	0.896	0.886	2	0.885	0.881	0.890	0.898	0.907	0.905
3	0.821	0.823	0.823	0.827	0.836	0.830	4	0.815	0.822	0.821	0.833	0.843	0.832
5	0.835	0.833	0.836	0.825	0.857	0.854	6	0.883	0.881	0.908	0.943	0.928	0.953
M <sub>00</sub> =	2.2	<del></del> -5	α =	5.0		m <sub>o</sub> /	$m_{\infty} = 1$		]	Exit s	etting	=E	3
P <sub>t2</sub>	2/p <sub>t∞</sub> =	0.86	<u> </u>	1/™∞ =	0.100		pt2 -	0.18	סי		- <sub>P2</sub> / P	∞ <sup>-</sup>	7.25
RAKE										<del></del>			
NO.			TUBE	NO.			RAKE			TUBE	NO.		
	1	2	3	Γ	5	6	RAKE NO.	1	2	TUBE	NO.	5	6
1	<del> </del>			4			NO.	<del>                                     </del>		3	Ί	5	6
3	0.893	0.893	3	4 0.916	0.882	0.863	NO. 2	0.876	0.878	3 0.890	14	5 0.919	6 0.912
	0.893	0.893	3	4 0.916 0.827	0.882	0.863	NO. 2 4	0.876 0.789	0.878	3 0.890 0.808	4 0.904	5 0.919 0.833	6 0.912 0.829
<u>3</u> 5	0.893 0.805 0.821	0.893 0.806 0.824	3 0.908 0.814 0.832	4 0.916 0.827 0.823	0.882 0.843 0.858	0.863 0.848 0.865	NO. 2 4 6	0.876 0.789	0.878 0.802 0.878	3 0.890 0.808 0.916	0.904 0.821	5 0.919 0.833 0.922	6 0.912 0.829 0.932
3 5 M <sub>∞</sub> =	0.893 0.805 0.821	0.893 0.806 0.824	3 0.908 0.814 0.832 α =	14 0.916 0.827 0.823 5.0	0.882 0.843 0.858	0.863 0.848 0.865 m <sub>o</sub>	NO. $2$ $4$ $6$ $/m_{\infty} =$	0.876 0.789 0.878	0.878 0.802 0.878	3 0.890 0.808 0.916 Exit s	0.904 0.821 0.948	5 0.919 0.833 0.922 =	6 0.912 0.829 0.932
$\frac{3}{5}$ $M_{\infty} = \frac{1}{p_{t_2}}$	0.893 0.805 0.821	0.893 0.806 0.824	3 0.908 0.814 0.832 α =	14 0.916 0.827 0.823 5.0	0.882 0.843 0.858	0.863 0.848 0.865 m <sub>o</sub>	NO. $ \begin{array}{c} 2 \\ 4 \\ 6 \end{array} $ $ \begin{array}{c} m_{\infty} = \\ p_{t_2} = \\ \end{array} $	0.876 0.789 0.878	0.878 0.802 0.878	3 0.890 0.808 0.916 Exit s	0.904 0.821 0.948 etting	5 0.919 0.833 0.922 =	6 0.912 0.829 0.932
3 5 M <sub>∞</sub> =	0.893 0.805 0.821	0.893 0.806 0.824	3 0.908 0.814 0.832 α =	14 0.916 0.827 0.823 5.0	0.882 0.843 0.858	0.863 0.848 0.865 m <sub>o</sub>	NO. $2$ $4$ $6$ $/m_{\infty} =$	0.876 0.789 0.878	0.878 0.802 0.878	3 0.890 0.808 0.916 Exit s	0.904 0.821 0.948 etting	5 0.919 0.833 0.922 =	6 0.912 0.829 0.932
$\frac{3}{5}$ $M_{\infty} = \frac{1}{p_{t_2}}$ RAKE	0.893 0.805 0.821 = 2.2 /Pt <sub>w</sub> =	0.893 0.806 0.824 5 0.856	3 0.908 0.814 0.832 α = 6 m <sub>b</sub> TUBE	14 0.916 0.827 0.823 5.0° 1/m <sub>\infty</sub> =	0.882 0.843 0.858 0.085	0.863 0.848 0.865 mo	NO. $2$ $4$ $6$ $/m_{\infty} =$ $Pt_{2} =$ $RAKE$ $NO.$	0.876 0.789 0.878 0.20	0.878 0.802 0.878 	3 0.890 0.808 0.916 Exit s	0.904 0.821 0.948 etting p <sub>2</sub> /p	5 0.919 0.833 0.922 =	6 0.912 0.829 0.932
3 5 $M_{\infty} =$ $\bar{P}_{t_2}$ RAKE	0.893 0.805 0.821 = 2.2 2/pt <sub>\infty</sub> = 1 0.889	0.893 0.806 0.824 5 0.850 2 0.890	3 0.908 0.814 0.832 α = 6 mb	14 0.916 0.827 0.823 5.0 1/m <sub>\infty</sub> = NO. 4 0.912	0.882 0.843 0.858 0.083	0.863 0.848 0.865 — m <sub>o</sub> 3 Δ	NO. $2$ $4$ $6$ $/m_{\infty} =$ $Pt_{2} =$ $RAKE$ $NO.$ $2$	0.876 0.789 0.878 0.20	0.878 0.802 0.878 	3 0.890 0.808 0.916 Exit s	0.904 0.821 0.948 etting P <sub>2</sub> /P NO. 4 0.901	5 0.919 0.833 0.922 = _C ∞ = _C 5 0.918	6 0.912 0.829 0.932

M <sub>∞</sub> =	2.00	)	<u>α</u> =	<u>5.0</u>	) <b>°</b>	_ m <sub>o</sub> /	′m <sub>∞</sub> = .		E	Exit se	etting	= <u>A</u>	<u> </u>
₱t <sub>2′</sub>	$/p_{t_{\infty}} =$	0.859	m <sub>b</sub> ]	L/m <sub>∞</sub> =	0.10	)2 Δ <u>r</u>	o <sub>t2</sub> = .	0.18	39		p <sub>2</sub> /p <sub>0</sub>	o = _6	5.12
RAKE			TUBE	NO.			RAKE		·	TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.882	0.912	0.939	0.932	0.901	0.859	2	0.852	0.863	0.879	0.911	0.915	0.904
3	0.812	0.818	0.811	0.804	0.796	0.785	4	0.814	0.825	0.830	0.833	0.822	0 <b>.7</b> 97
5	0.842	0.840	0.828	0.790	0.797	0.780	6	0.886	0.916	0.938	0.933	0.932	0.942
$M_{\infty} =$	2.00	)	<u>α</u> =	5.0	)°	_ m <sub>o</sub> /	$m_{\infty} = 1$		<u> </u>	Exit se	etting	= B	
p̄t2′	$/p_{t_{\infty}} =$	0.86	68 m <sub>b</sub>	$L/m_{\infty} =$	0.08	30 <u> </u>	)t <sub>2</sub> = .	0.16	52		. p <sub>2</sub> /p <sub>6</sub>	<sub>x</sub> = <u>6</u>	5.13
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.901	0.926	0.940	0.928	0.899	0.857	2	0.881	0.901	0.907	0.907	0.906	0.893
3	0.823	0.823	0.820	0.820	0.822	0.809	4	0.803	0.800	0.799	0.800	0.820	0.802
i _	0.81.7	0 81.8	0 857	0 828	0.860	01.0	6	ال م	000	0 027	0 010	0 000	2 22 6
5	0.047	0.040	0.057	0.030	0.000	0.040	0	0.904	0.923	0.931	0.940	0.939	0.926
	2.00												
M <sub>∞</sub> =		)	_ α =	5.0	) <b>°</b>	m <sub>o</sub> /	/ <sub>m∞</sub> = .		]	Exit s	etting	= _ C	;
$M_{\infty} = \bar{p}_{t_2}$	2.00	)	$-\alpha = \frac{\pi}{1}$		) <b>°</b>	m <sub>o</sub> /	/m <sub>∞</sub> = .		]	Exit s	etting	= _ C	;
$M_{\infty} = \overline{p}_{t_2}$		0.8	α = 71_ mb. TUBE	$\frac{5.0}{1/m_{\infty}} = \frac{1}{1}$	0.07	m <sub>O</sub> /	$m_{\infty} = \frac{1}{2}$	0.16	- <u> </u>	Exit se	etting p <sub>2</sub> /p <sub>0</sub>	= <u> </u>	5.14
$M_{\infty} = \bar{p}_{t_2}$ RAKE	2.00 /p <sub>t</sub> =	0.8	$\alpha = \frac{\alpha}{100}$ TUBE	$\frac{5.0}{1/m_{\infty}} = \frac{1}{NO}$	0.073 5	m <sub>o</sub> , Δ <u>r</u>	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.16	1 69 2	Exit so TUBE	P <sub>2</sub> /P <sub>0</sub>	= <u>C</u> = <u>6</u>	5.14 6
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	2.00 /pt <sub>w</sub> = 1 0.901	0.8° 2 0.920	$\alpha = \frac{71}{\text{TUBE}}$ $\frac{\text{TUBE}}{3}$ $0.934$	$5.0$ $1/m_{\infty} =$ NO. 4 0.936	0.073 5 0.905	m <sub>ο</sub> , Δ <sub>1</sub> 6 0.866	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.16	2 0.911	TUBE 3 0.918	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916	=	6
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	2.00 /pt <sub>w</sub> =  1 0.901 0.829	0.8° 2 0.920 0.825	$\alpha = \frac{71}{1000}$ mb $\frac{1}{1000}$ TUBE $\frac{3}{1000}$ 0.824	$5.0$ $1/m_{\infty} =$ NO. $4$ 0.936 0.827	0.073 5 0.905 0.836	m <sub>o</sub> , Δ <sub>1</sub> 6 0.866 0.829	/m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO 2	0.16 1 0.887 0.795	2 0.911 0.800	TUBE 3 0.918 0.804	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810	=	6 0.900 0.805
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	2.00 /pt <sub>w</sub> =  1 0.901 0.829	0.8° 2 0.920	$\alpha = \frac{71}{1000}$ mb $\frac{1}{1000}$ TUBE $\frac{3}{1000}$ 0.824	$5.0$ $1/m_{\infty} =$ NO. $4$ 0.936 0.827	0.073 5 0.905 0.836	m <sub>o</sub> , Δ <sub>1</sub> 6 0.866 0.829	/m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO 2	0.16 1 0.887 0.795	2 0.911 0.800	TUBE 3 0.918 0.804	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810	=	6 0.900 0.805
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	2.00 /pt <sub>w</sub> =  1 0.901 0.829	0.8° 2 0.920 0.825 0.848	$\alpha = \frac{71}{1000}$ TUBE $\frac{3}{0.934}$ 0.824 0.848	$5.0$ $1/m_{\infty} =$ NO. $4$ 0.936 0.827 0.832	0.073 5 0.905 0.836 0.862	m <sub>o</sub> , Δ <sub>1</sub> 6 0.866 0.829	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.16 1 0.887 0.795 0.907	2 0.911 0.800 0.928	TUBE 3 0.918 0.804 0.942	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810 0.939	=	6 0.900 0.805 0.927
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	2.00 /pt <sub>w</sub> =  1 0.901 0.829 0.851	0.8° 2 0.920 0.825 0.848	$\alpha = \frac{1}{1} \text{ mb}$ TUBE  3 0.934 0.824 0.848 $\alpha = \frac{1}{1}$	5.0 1/m <sub>∞</sub> =  NO.  4  0.936  0.827  0.832  5.0	0.073 5 0.905 0.836 0.862	6 0.866 0.829 0.858	$m_{\infty} = \frac{1}{2}$ RAKE NO. $m_{\infty} = \frac{1}{2}$	0.16 1 0.887 0.795 0.907	2 0.911 0.800 0.928	TUBE 3 0.918 0.804 0.942	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810 0.939 etting	= 0 = 6 5 0.909 0.808 0.929	6 0.900 0.805 0.927
$M_{\infty} = \bar{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	2.00 /pt <sub>w</sub> =  1 0.901 0.829 0.851	0.8° 2 0.920 0.825 0.848	$\alpha = \frac{1}{1} \text{ mb}$ TUBE  3 0.934 0.824 0.848 $\alpha = \frac{1}{1}$	$5.0$ $1/m_{\infty} =$ NO.  4  0.936  0.827  0.832 $5.0$ $1/m_{\infty} =$	0.073 5 0.905 0.836 0.862	6 0.866 0.829 0.858	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE	0.16 1 0.887 0.795 0.907	2 0.911 0.800 0.928	TUBE 3 0.918 0.804 0.942	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810 0.939 etting P <sub>2</sub> /P <sub>0</sub>	= 0 = 6 5 0.909 0.808 0.929 = A	6 0.900 0.805 0.927
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3 $\bar{p}_{t_2}$	2.00 /pt <sub>w</sub> =  1 0.901 0.829 0.851	0.8° 2 0.920 0.825 0.848	$\alpha = \frac{1}{1} \text{ mb}$ TUBE  3 0.934 0.824 0.848 $\alpha = \frac{1}{1} \text{ mb}$	$5.0$ $1/m_{\infty} =$ NO.  4  0.936  0.827  0.832 $5.0$ $1/m_{\infty} =$	0.073 5 0.905 0.836 0.862	6 0.866 0.829 0.858	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6	0.16 1 0.887 0.795 0.907	2 0.911 0.800 0.928	TUBE 3 0.918 0.804 0.942 Exit se	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810 0.939 etting P <sub>2</sub> /P <sub>0</sub>	= 0 = 6 5 0.909 0.808 0.929 = A	6 0.900 0.805 0.927
$M_{\infty} = \bar{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	2.00 /pt <sub>w</sub> =  1 0.901 0.829 0.851 1.79 /pt <sub>w</sub> =	0.8°  0.920  0.825  0.848  0.926	$\alpha = \frac{1}{1000}$ TUBE  3 0.934 0.824 0.848 $\alpha = \frac{1}{1000}$ TUBE 3	$5.0$ $1/m_{\infty} =$ NO.  4  0.936  0.827  0.832 $5.0$ $1/m_{\infty} =$ NO.  4	0.073 5 0.905 0.836 0.862	6 0.866 0.829 0.858 m <sub>o</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE	0.16	2 0.911 0.800 0.928	TUBE 3 0.918 0.804 0.942 Exit so	etting $\begin{array}{c} p_{2}/p_{0} \\ NO. \\ 4 \\ 0.916 \\ 0.810 \\ 0.939 \\ \text{etting} \\ p_{2}/p_{0} \\ NO. \\ 4 \\ \end{array}$		6 0.900 0.805 0.927 4
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \bar{p}_{t_2}$ RAKE NO.	2.00 /pt <sub>w</sub> =  1 0.901 0.829 0.851  1.79 /pt <sub>w</sub> =	0.8°  0.920  0.825  0.848  0.926	$\alpha = \frac{1}{1} m_{b}$ TUBE  3 0.934 0.824 0.848 $\alpha = \frac{1}{1} m_{b}$ TUBE 3 0.970	$5.0$ $1/m_{\infty} =$ NO.  4  0.936  0.827  0.832 $5.0$ $1/m_{\infty} =$ NO.  4  0.943	0.073 5 0.905 0.836 0.862 0.119 5 0.914	6 0.866 0.829 0.858 mo  Δ 6 0.894	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.16  1 0.887 0.795 0.907  0.08	2 0.911 0.800 0.928 - 1 32 2 0.906	TUBE 3 0.918 0.804 0.942 Exit so TUBE 3 0.906	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.916 0.810 0.939 etting P <sub>2</sub> /P <sub>0</sub> NO. 4 0.914		6 0.900 0.805 0.927 4.54 6 0.906

M <sub>∞</sub> =	1.75	5	_ α =	5.0°		_ m <sub>o</sub> /	′m <sub>∞</sub> = _		E	Exit se	etting	= <u> </u>	3
₽ <sub>te</sub>	/p <sub>t∞</sub> =	0.92	m <sub>b</sub> ]	$L/m_{\infty} =$	0.08	<u>β6</u> Δ <u>ι</u>	) <sub>t2</sub> = _	0.11	.2		p <sub>2</sub> /p <sub>0</sub>	° =	43
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.964	0.969	0.964	0.927	0.896	0.866	2	0.924	0.904	0.908	0.925	0.917	0.902
	0.917							0.879	0.883	0.886	0.889	0.895	0.895
5	0.917	0.935	0.943	0.924	0.943	0.939	6	0.904	0.902	0.914	0.931	0.947	0.949
M <sub>∞</sub> =	1.7	5	_ α =	5.0	) <b>°</b>	_ m <sub>o</sub> /	′m <sub>∞</sub> = _		I	Exit se	etting	=	
<u>.</u>	/p <sub>t</sub> =	0.019	Ω m <sub>s</sub> -	./m =	0.05	7), ^r	). =	0 10	) E		n /n	= 1	. 28
Pt2	, <sub>P</sub> t∞ _	0.910	<u></u>			<u> </u>	τ <sub>2</sub> .	0.12			. F2/Fo	×	+•30
RAKE		ı	TUBE	1			RAKE			TUBE	ı		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.963	0.969	0.961	0.920	0.887	0.854	2	0.924	0.904	0.907	0.929	0.920	0.899
3	0.914	0.930	0.932	0.934	0.935	0.928	4	0.872	0.876	0.879	0.884	0.894	0.887
			0 006	0.010	0 01:0	0.000				0 071	0000	1	0.001
_ 5	0.914	0.930	0.936	0.919	0.940	0.936	6	0.905	0.902	0.914	0.929	0.954	0.964
	<del></del>	4	·				·	·			<u> </u>	·	<u></u>
M <sub>∞</sub> =	1.5	5	_ α =	5.0	<b>5</b>	m <sub>o</sub> ,	/ <sub>m∞</sub> = .		]	Exit s	etting	=	A
M <sub>∞</sub> =	<del></del>	5	_ α =	5.0	<b>5</b>	m <sub>o</sub> ,	/ <sub>m∞</sub> = .		]	Exit s	<u> </u>	=	A
$M_{\infty} = \bar{p}_{t_2}$	1.5	5	_ α =		<b>5</b>	m <sub>o</sub> ,	/m <sub>∞</sub> = .		]	Exit s	etting	=	A
M <sub>∞</sub> =		5	α =  O m <sub>b</sub> :	$\frac{5.0}{1^{/m}_{\infty}} = \frac{5.0}{1}$	<b>5</b>	m <sub>o/</sub>	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.083	- 1 L	Exit s	etting	=	3.46
$M_{\infty} = \bar{p}_{t_2}$	1.5 /pt <sub>w</sub> =	0.950	$\alpha = \frac{\alpha}{1000} = \frac{1000}{1000}$ TUBE	$\frac{5.0}{1/m_{\infty}} = \frac{5.0}{1}$ NO.	0.109	m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ $RAKE$	0.081	- 1 L 2	TUBE	p <sub>2</sub> /p <sub>0</sub>	=	3.46 6
$M_{\infty} = \bar{p}_{t_2}$ RAKE	1.5 /pt <sub>w</sub> =	0.950	$\alpha = \frac{\alpha}{2} = \frac{m_{b}}{2}$ TUBE $\frac{3}{0.981}$	$5.0^{\circ}$ $1/m_{\infty} = 1$ NO. 4 0.957	0.109 5 0.939	m <sub>o</sub> ,  Δ <sub>1</sub> 6  0.916	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.083	2 0.946	TUBE 3 0.954	P <sub>2</sub> /P <sub>0</sub>	=	6 0.951
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1.5 /Pt <sub>∞</sub> =  1 0.989 0.936	0.950 2 0.988	$\alpha = \frac{\alpha}{m_{b}}$ TUBE  3 0.981 0.958	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.957  0.961	0.109 5 0.939 0.962	m <sub>o</sub> ,  β Δ <sub>1</sub> 6  0.916  0.961	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.081 1 0.946 0.912	2 0.946 0.918	TUBE 3 0.954 0.922	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.957	=	6 0.951 0.932
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	1.5 /Pt <sub>∞</sub> =  1 0.989 0.936	0.950 2 0.988 0.951 0.957	α =  TUBE  3 0.981 0.958 0.969	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.957  0.961	0.109 5 0.939 0.962 0.968	- m <sub>o</sub> ,  β Δ <sub>1</sub> 6  0.916  0.961  0.967	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.081 1 0.946 0.912	2 0.946 0.918 0.944	TUBE 3 0.954 0.922 0.955	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.957 0.926	=	6 0.951 0.959
$M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$ RAKE NO.  1 3 5 $M_{\infty} = \frac{1}{2}$	1.5 /Pt <sub>w</sub> =  1 0.989 0.936 0.936	0.950 2 0.988 0.951 0.957	$\alpha = \frac{\alpha}{1000}$ TUBE  3  0.981  0.958  0.969 $\alpha = \frac{\alpha}{1000}$	$ \begin{array}{c} 5.0^{\circ} \\ 1/m_{\infty} = \\ NO. \\ 4 \\ 0.957 \\ 0.961 \\ 0.954 \\ 5.0^{\circ} \end{array} $	0.109 5 0.939 0.962 0.968	m <sub>o</sub> ,  β Δ <sub>1</sub> 6  0.916  0.967  m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $6$	0.082 1 0.946 0.912 0.945	2 0.946 0.918 0.944	TUBE 3 0.954 0.922 0.955	P_/P, NO. 4 0.957 0.926 0.957 etting	=	6 0.951 0.932 0.959
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1  3 $\bar{p}_{t_2}$	1.5 /Pt <sub>w</sub> =  1 0.989 0.936 0.936	0.950 2 0.988 0.951 0.957	$\alpha = \frac{\alpha}{100} = $	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.957  0.961  0.954 $5.0^{\circ}$	0.109 5 0.939 0.962 0.968	m <sub>o</sub> ,  β Δ <sub>1</sub> 6  0.916  0.967  m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $\frac{1}{4}$ $6$ $m_{\infty} = \frac{1}{2}$	0.082 1 0.946 0.912 0.945	2 0.946 0.918 0.944	TUBE 3 0.954 0.922 0.955 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.957 0.926 0.957 etting P <sub>2</sub> /P <sub>0</sub>	=	6 0.951 0.932 0.959
$M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$ RAKE NO.  1 3 5 $M_{\infty} = \frac{1}{2}$	1.5 /Pt <sub>w</sub> =  1 0.989 0.936 0.936	0.950 2 0.988 0.951 0.957	$\alpha = \frac{\alpha}{1000}$ TUBE  3  0.981  0.958  0.969 $\alpha = \frac{\alpha}{1000}$	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.957  0.961  0.954 $5.0^{\circ}$	0.109 5 0.939 0.962 0.968	m <sub>o</sub> ,  β Δ <sub>1</sub> 6  0.916  0.967  m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $6$	0.082 1 0.946 0.912 0.945	2 0.946 0.918 0.944	TUBE 3 0.954 0.922 0.955	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.957 0.926 0.957 etting P <sub>2</sub> /P <sub>0</sub>	=	6 0.951 0.932 0.959
$M_{\infty} = \bar{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$ RAKE	1.5 /Pt <sub>w</sub> =  1 0.989 0.936 0.936 - 1.5 /Pt <sub>w</sub> =	0.950 2 0.988 0.951 0.957 5	$\alpha = \frac{\alpha}{2} = $	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.957  0.961  0.954 $5.0^{\circ}$ NO.  4	5 0.939 0.962 0.968	m <sub>o</sub> ,  6 0.916 0.967  m <sub>o</sub> ,  2 6	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.	0.083 1 0.946 0.912 0.945	2 0.946 0.918 0.944	TUBE  3 0.954 0.922 0.955 Exit s  TUBE 3	etting $p_2/p_0$ NO.  4 0.957 0.926 0.957 etting $p_2/p_0$ NO.	=	6 0.951 0.932 0.959
$M_{\infty} = \bar{p}_{t,2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	1.5 /Pt <sub>w</sub> =  1 0.989 0.936 0.936 0.936 /Pt <sub>w</sub> =  1 0.984	2 0.950 0.988 0.951 0.957 5	α =  0 mb:  TUBE 3 0.981 0.958 0.969 α =  9 mb:  TUBE 3 0.984	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.957  0.961  0.954  5.0 $1/m_{\infty} =$ NO.  4  0.962	0.109 5 0.939 0.962 0.968 0.079 5	- m <sub>o</sub> /  6 0.916 0.961 0.967 - m <sub>o</sub> / 6 0.909	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $6$ $m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.081 1 0.946 0.912 0.945 0.0	2 0.946 0.918 0.944 - 0.86 2 0.946	TUBE 3 0.954 0.922 0.955 Exit s TUBE 3 0.951	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.957 0.926 0.957 etting P <sub>2</sub> /P <sub>0</sub> NO.  4	=	6 0.951 0.959 .42 6 0.950
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1.5 /Pt <sub>w</sub> =  1 0.989 0.936 0.936 -1.5 /Pt <sub>w</sub> =  1 0.984 0.934	2 0.950 0.988 0.951 0.957 5 0.949	α =  O mb:  TUBE  3  0.981  0.969  α =  9 mb:  TUBE  3  0.984  0.960	$5.0$ ° $1/m_{\infty} =$ $1/m_{\infty} =$ $0.957$ $0.961$ $0.954$ $0.962$ $0.963$	0.109 5 0.939 0.962 0.968 0.079 5 0.934 0.965	m <sub>o</sub> ,  6 0.916 0.967  m <sub>o</sub> ,  6 0.967  0.963	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4	0.083 1 0.946 0.912 0.945 0.0	2 0.946 0.918 0.944 	TUBE  3 0.954 0.922 0.955 Exit s  TUBE  3 0.951 0.914	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.957 0.926 0.957 etting P <sub>2</sub> /P <sub>0</sub> NO. 4 0.954 0.917	=	6 0.951 0.959 .42 6 0.950

 $M_{\infty} = \underline{1.55} \qquad \alpha = \underline{5.0^{\circ}} \qquad m_{0}/m_{\infty} = \underline{\qquad} \qquad \text{Exit setting} = \underline{C}$   $\bar{p}_{t_{2}}/p_{t_{\infty}} = \underline{0.947} \qquad m_{b1}/m_{\infty} = \underline{0.069} \qquad \Delta p_{t_{2}} = \underline{0.096} \qquad p_{2}/p_{\infty} = \underline{3.38}$ 

RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.983	0.987	0.982	0.957	0.935	0.905	2	0.950	0.945	0.951	0.954	0.949	0.950
3	0.933	0.952	0.959	0.963	0.966	0.960	4	0.896	0.905	0.909	0.912	0.918	0.914
5	0.930	0.949	0.965	0.955	0.965	0.969	6	0.947	0.945	0.954	0.956	0.957	0.958

M <sub>oo</sub> =	3.00		<u>α</u> =	0.00		_ m <sub>o</sub> /	_ m <sub>∞</sub> = _	0.999	F	Cxit s€	etting	= <u>A</u>	<del></del>
Pt <sub>2</sub> /	$p_{t_{\infty}} =$	0.907	m <sub>bl</sub>	$m_{\infty} =$	0.137		)t2 = _	0.134	·		p <sub>2</sub> /p <sub>a</sub>	<sub>0</sub> = <u>31</u> .	.29
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.862	0.894	0.946	0.952	0.896	0.857	2	0.868	0.921	0.952	0.971	0.906	0.855
3				0.972			1 1	0.867	0.908	0.951	0.963	0.912	0.864
5				0.969		1	1 1	0.863	0.915	0.962	0.954	0.883	0.850
M <sub>∞</sub> =	3.00			0.00			_	0.999	F	Exit se	etting	= <u>A</u>	
				,							,		
Pt2	/ <sub>pt_∞</sub> =	0.882		L/m <sub>∞</sub> =	0.111		)t2 = .	0.164			. p <sub>2</sub> /p <sub>0</sub>	。= <u>29</u>	•94
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.820	0.872	0.944	0.942	0.876	0.825	2	0.830	0.895	0.940	0.928	0.900	0.821
3	0.821	0.873	0.936	0.936	0.901	0.827	4	0.831	0.896	0.959	0.937	0.868	0.820
5	0.827	0.879	0.939	0.943	0.859	0.814	6	0.824	0.887	0.959	0.952	0.867	0.819
								0.999	1	Exit s	etting	= <u>A</u>	
M <sub>∞</sub> =	3.00		_ α =	0.00		m <sub>o</sub> ,	$m_{\infty} = 1$	0.999		Exit s			
M <sub>∞</sub> =	3.00		_ α =			m <sub>o</sub> ,	$m_{\infty} = 1$		1	Exit s		= <u>A</u> <sub>∞</sub> = <u>25</u>	•79
$M_{\infty} = \overline{p}_{t_2}$	3.00		_ α =	$\frac{0.0^{\circ}}{1/m_{\infty}} =$		m <sub>o</sub> ,	$m_{\infty} = 1$		1	Exit s TUBE	_ p <sub>2</sub> /p <sub>0</sub>		•79
M <sub>∞</sub> =	3.00		$\alpha = \frac{\alpha}{2}$	$\frac{0.0^{\circ}}{1/m_{\infty}} =$		m <sub>o</sub> ,	/m <sub>∞</sub> =		2		_ p <sub>2</sub> /p <sub>0</sub>		•79
$M_{\infty} = \bar{p}_{t_2}$ RAKE	3.00 /p <sub>t<sub>∞</sub></sub> =	<b>0.77</b> 7	α = 7 mb TUBE	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$	<b>0.</b> 087	m <sub>o</sub> ,	$/m_{\infty} =$ $p_{t_2} =$ RAKE	0.332	2	TUBE	p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>25</u>	6
$M_{\infty} = \overline{p}_{t_2}$ RAKE	3.00 /p <sub>t</sub> = 1 0.663	0.777 2 0.666	$\alpha = \frac{\alpha}{7}$ $\frac{m_b}{TUBE}$ $\frac{3}{0.715}$	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{1}{NO}$ $\frac{1}{4}$ $0.835$	0.087 5 0.893	m <sub>o</sub> , Δ;	$/m_{\infty} =$ $p_{t_2} =$ RAKE NO.	0.332	2	TUBE 3 0.808	P <sub>2</sub> /P <sub>0</sub>	5 0.897	6 0.755
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	3.00 /p <sub>t</sub> = 1 0.663 0.666	0.777 2 0.666 0.691	α = 7mb TUBE 3 0.715 0.781	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$	0.087 5 0.893 0.899	m <sub>o</sub> , Δ; 6 0.777 0.773	$m_{\infty} = m_{t_2} = m_{t_2} = m_{t_2}$ RAKE NO.	0.332 1 0.668 0.666	2 0.705 0.687	TUBE 3 0.808 0.764	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.921	5 0.897 0.868	6 0.755 0.771
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	3.00 /pt <sub>w</sub> = 1 0.663 0.666	0.777 2 0.666 0.691 0.683	α = 7	$0.0^{\circ}$ $1/m_{\infty} = 0.835$ $0.903$ $0.909$	0.087 5 0.893 0.899 0.906	6 0.777 0.777	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.332 1 0.668 0.666 0.663	2 0.705 0.687 0.674	TUBE 3 0.808 0.764 0.735	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.921 0.891	5 0.897 0.868 0.897	6 0.755 0.771
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	3.00 /pt <sub>w</sub> =  1 0.663 0.666 0.665	0.777 2 0.666 0.691 0.683	$\alpha = \frac{1}{2} \alpha = $	$0.0^{\circ}$ $1/m_{\infty} = \frac{1}{1}$ $0.835$ $0.903$ $0.909$ $0.0^{\circ}$	0.087 5 0.893 0.899 0.906	6 0.777 0.773 0.777	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.332 1 0.668 0.666 0.663	2 0.705 0.687 0.674	TUBE 3 0.808 0.764 0.735	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.921 0.891 0.855 etting	5 0.897 0.868 0.897 = C	6 0.755 0.771 0.782
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	3.00 /pt <sub>w</sub> =  1 0.663 0.666 0.665	0.777 2 0.666 0.691 0.683	$\alpha = \frac{1}{2} \frac{m_b}{m_b}$ TUBE  3  0.715  0.781  0.762	$0.0^{\circ}$ $1/m_{\infty} = 0.835$ $0.903$ $0.909$	0.087 5 0.893 0.899 0.906	6 0.777 0.773 0.777	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.332 1 0.668 0.666 0.663	2 0.705 0.687 0.674	TUBE 3 0.808 0.764 0.735	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.921 0.891 0.855 etting	5 0.897 0.868 0.897	6 0.755 0.771 0.782
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t_2}$	3.00 /pt <sub>w</sub> =  1 0.663 0.666 0.665	0.777 2 0.666 0.691 0.683	$\alpha = \frac{1}{2} \frac{m_b}{m_b}$ TUBE  3  0.715  0.781  0.762	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.0^{\circ}$ $0.0^{\circ}$ $0.835$ $0.903$ $0.909$ $0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$	0.087 5 0.893 0.899 0.906	6 0.777 0.773 0.777	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.332 1 0.668 0.666 0.663	2 0.705 0.687 0.674	TUBE 3 0.808 0.764 0.735	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.921 0.891 0.855 etting	5 0.897 0.868 0.897 = C	6 0.755 0.771 0.782
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	3.00 /pt <sub>w</sub> =  1 0.663 0.666 0.665	0.777 2 0.666 0.691 0.683	$\alpha = \frac{1}{2} \frac{m_b}{m_b}$ TUBE  3  0.715  0.781  0.762 $\alpha = \frac{1}{2} \frac{m_b}{m_b}$	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.0^{\circ}$ $0.0^{\circ}$ $0.835$ $0.903$ $0.909$ $0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$	0.087 5 0.893 0.899 0.906	6 0.777 0.773 0.777	$m_{\infty} = \frac{1}{2}$	0.332 1 0.668 0.666 0.663	2 0.705 0.687 0.674	TUBE 3 0.808 0.764 0.735 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.921 0.891 0.855 etting	5 0.897 0.868 0.897 = C	6 0.755 0.771 0.782
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	3.00 /pt <sub>w</sub> =  1 0.663 0.665 0.665 2.00 /pt <sub>w</sub> =	0.777 2 0.666 0.691 0.683	$\alpha = \frac{\alpha}{7}$ $\frac{m_b}{7}$ $\frac{3}{9.715}$ $\frac{0.781}{9.762}$ $\alpha = \frac{m_b}{7}$ $\frac{3}{1000}$	$0.0^{\circ}$ $1/m_{\infty} = 1$	0.087 5 0.893 0.899 0.906	6 0.777 0.777 mo	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$ $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.332 1 0.668 0.666 0.663 0.99 0.166	2 0.705 0.687 0.674	TUBE 3 0.808 0.764 0.735 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.921 0.891 0.855 etting P <sub>2</sub> /P NO.	$_{\infty} = 25$ $\begin{array}{r} 5 \\ 0.897 \\ 0.868 \\ 0.897 \\ = \underline{c} \\ \infty = \underline{30} \end{array}$	6 0.755 0.771 0.782
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	3.00 $p_{t_{\infty}} = \frac{1}{0.663}$ 0.666 0.665 3.00 $p_{t_{\infty}} = \frac{1}{0.846}$	0.777 2 0.666 0.691 0.683 0.890	α = 7	$0.0^{\circ}$ $1/m_{\infty} = 1$	5 0.893 0.899 0.906 0.100	6 0.777 0.773 0.777  mo 6 0.825	$m_{\infty} = \frac{1}{2}$ RAKE NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE NO. $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.332 1 0.668 0.666 0.663 0.99 0.166	2 0.705 0.687 0.674	TUBE  3 0.808 0.764 0.735 Exit s  TUBE 3 0.949	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.921 0.891 0.855 etting P <sub>2</sub> /P NO.  4 0.960	5 0.897 0.868 0.897 = <u>C</u> = 30	6 0.755 0.771 0.782
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	3.00 $p_{t_{\infty}} = \frac{1}{0.663}$ 0.665 $0.665$ $p_{t_{\infty}} = \frac{1}{0.846}$ 0.846	0.777 2 0.666 0.691 0.683 0.890	$\alpha = \frac{\alpha}{1000}$ TUBE  3  0.715  0.781  0.762 $\alpha = \frac{1000}{1000}$ TUBE  3  0.956	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $1/m_{\infty} = 0.835$ $0.903$ $0.909$ $0.0^{\circ}$ $1/m_{\infty} = 0.918$	0.087 5 0.893 0.899 0.906 0.100 5 0.855 0.879	6 0.777 0.773 0.777 mo 6 0.825	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE NO. 2  RAKE NO. 2	0.332 1 0.668 0.666 0.663 0.99 0.166 1 0.842 0.834	2 0.705 0.687 0.674 2 0.906 0.880	TUBE 3 0.808 0.764 0.735 Exit s TUBE 3 0.949 0.938	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.921 0.891 0.855 etting P <sub>2</sub> /P NO.  4 0.960 0.959	5 0.897 0.868 0.897 = C = 30 5 0.894 0.895	6 0.755 0.771 0.782 0.19

M <sub>∞</sub> =	3.00		_ α =	0.00		_ m <sub>o</sub> /	'm <sub>∞</sub> = <u>1</u>	0.999	E	Cxit s€	etting	= <u>C</u>	
p <sub>t2</sub> /	/p <sub>t∞</sub> =	0.865	<sup>m</sup> bl	_/m <sub>∞</sub> =	0.080		)t <sub>2</sub> = <u> </u>	0.194			p <sub>2</sub> /p <sub>o</sub>	o = <u>28</u>	.82
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.827	0.914	0.950	0.878	0.799	0 <b>.7</b> 83	2	0.821	0.901	0.944	0.941	0.842	0.795
3	0.834	0.914	0.945	0.853	0.789	0.783	4	0.817	0.888	0.947	0.930	0.840	0.794
5	0.808	0.881	0.931	0.945	0.849	0.797	6	0.809	0.894	0.942	0.933	0.834	0.791
$M_{\infty} =$	3.00		_ α =	0.00		_ m <sub>o</sub> /	′m <sub>∞</sub> = _	0.999	F	Exit se	etting	= <u>C</u>	
Pt <sub>2</sub>	$p_{t_{\infty}} =$	0.797	m <sub>b</sub> ]	$_{\rm L}/m_{\infty} =$	0.069		)t2 = .	0.315			_ p <sub>2</sub> /p <sub>6</sub>	<sub>∞</sub> = <u>25</u>	•53
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.761	0.890	0.903	0.785	0.704	0.691	2	0.733	0.869	0.938	0.855	0.737	0.702
3	0.805	0.926	0.882	0.761	0.697	0.691	4	0.749	0.866	0.917	0.801	0.709	0.692
5	0.722	0.824	0.941	0.884	0.739	0.703	6	0.779	0.926	0.920	0.797	0.704	0.693
$M_{\infty} =$	2.75		α =	0.00		m	/m <sub>m</sub> =	0.938	]	Exit s	etting	= A	
	2.75		<u>α</u> =										
		0.918											•77
$ar{p}_{tz'}$				$_{\rm L}/{\rm m}_{\infty} =$			9t <sub>2</sub> =	0.104 			p <sub>2</sub> /p <sub>0</sub>		•77
			3m <sub>b</sub>	$_{\rm L}/{\rm m}_{\infty} =$				0.104 			p <sub>2</sub> /p <sub>0</sub>		•77
p <sub>t2</sub>	/p <sub>t</sub> =	0.918	TUBE	$1/m_{\infty} = \frac{NO.}{4}$	<b>0.139</b> 5	Δ <sub>1</sub>	rake	0.104		TUBE	p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>21</u>	6
RAKE	/p <sub>t</sub> =	0.918	TUBE 3	$1/m_{\infty} = \frac{1}{1}$ NO. $\frac{1}{4}$ 0.935	0.139 5 0.953	6 0.897	RAKE	0.104	2	TUBE 3 0.922	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.912	5 0.944	6
RAKE NO.	/pt <sub>w</sub> =  1  0.886  0.893	0.918 2 0.940	TUBE 3 0.928	$1/m_{\infty} = \frac{1}{1/m_{\infty}}$ NO.  14 0.935 0.918	5 0.953 0.943	6 0.897 0.873	RAKE NO. 2	0.104 1 0.902 0.888	2	TUBE 3 0.922 0.951	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.912 0.938	5 0.944 0.951	6 0.864 0.889
P <sub>t2'</sub> RAKE NO.  1 3 5	/pt <sub>w</sub> =  1  0.886  0.893  0.891	0.918 2 0.940 0.951	TUBE 3 0.928 0.929 0.937	$1/m_{\infty} = \frac{1}{1/m_{\infty}}$ NO. $\frac{1}{4}$ 0.935 0.918 0.915	0.139 5 0.953 0.943 0.934	6 0.897 0.873 0.867	Pt <sub>2</sub> =  RAKE NO.  2 4 6	0.104 1 0.902 0.888 0.882	2 0.946 0.935 0.939	TUBE 3 0.922 0.951 0.950	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.912 0.938	5 0.944 0.951 0.926	6 0.864 0.889 0.857
$\overline{p}_{t2}$ RAKE NO.  1 3 5 $M_{\infty} =$	/pt <sub>w</sub> =  1 0.886 0.893 0.891 2.75	0.918 2 0.940 0.951 0.941	TUBE 3 0.928 0.929 0.937 α =	$1/m_{\infty} = \frac{1}{1}$ NO. $\frac{1}{4}$ 0.935 0.918 0.915	0.139 5 0.953 0.943 0.934	6 0.897 0.873 0.867	Pt <sub>2</sub> =  RAKE NO.  2  4  6	0.104 1 0.902 0.888 0.882 0.938	2 0.946 0.935 0.939	TUBE 3 0.922 0.951 0.950	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.938 0.917 etting	5 0.944 0.951 0.926 = A	6 0.864 0.889 0.857
$\overline{p}_{t2}$ RAKE NO.  1 3 5 $M_{\infty} =$	/pt <sub>w</sub> =  1 0.886 0.893 0.891 2.75	0.918 2 0.940 0.951 0.941	TUBE 3 0.928 0.929 0.937 α =	$1/m_{\infty} = \frac{1}{1}$ NO. $\frac{1}{4}$ 0.935 0.918 0.915	0.139 5 0.953 0.943 0.934	6 0.897 0.873 0.867	Pt <sub>2</sub> =  RAKE NO.  2  4  6	0.104 1 0.902 0.888 0.882 0.938	2 0.946 0.935 0.939	TUBE 3 0.922 0.951 0.950	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.938 0.917 etting	5 0.944 0.951 0.926	6 0.864 0.889 0.857
$\overline{p}_{t2}$ RAKE NO.  1 3 5 $M_{\infty} =$	/pt <sub>w</sub> =  1 0.886 0.893 0.891 2.75	0.918 2 0.940 0.951 0.941	TUBE 3 0.928 0.929 0.937 α =	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.935 0.918 0.915 0.00 $1/m_{\infty} = \frac{1}{m_{\infty}}$	0.139 5 0.953 0.943 0.934	6 0.897 0.873 0.867	Pt <sub>2</sub> =  RAKE NO.  2  4  6	0.104 1 0.902 0.888 0.882 0.938	2 0.946 0.935 0.939	TUBE 3 0.922 0.951 0.950	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.938 0.917 etting P <sub>2</sub> /P	5 0.944 0.951 0.926 = A	6 0.864 0.889 0.857
$\bar{p}_{t2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t2}$	/pt <sub>w</sub> =  1 0.886 0.893 0.891 2.75	0.918 2 0.940 0.951 0.941	TUBE 3 0.928 0.929 0.937 α =	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  4 0.935 0.918 0.915 0.00 $1/m_{\infty} = \frac{1}{m_{\infty}}$	0.139 5 0.953 0.943 0.934	6 0.897 0.873 0.867	RAKE NO. 2 4 6 6 /m <sub>∞</sub> =	0.104 1 0.902 0.888 0.882 0.938	2 0.946 0.935 0.939	TUBE  3 0.922 0.951 0.950 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.938 0.917 etting P <sub>2</sub> /P	5 0.944 0.951 0.926 = A	6 0.864 0.889 0.857
$\bar{p}_{t2}$ RAKE  NO.  1  3  5 $M_{\infty} = \bar{p}_{t2}$ RAKE	/p <sub>t</sub> = 1 0.886 0.893 0.891 2.75 /p <sub>t</sub> =	0.918 2 0.940 0.951 0.941	TUBE  3 0.928 0.929 0.937 α =  ""b:  TUBE 3	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  14  0.935  0.918  0.915  0.00 $1/m_{\infty} = \frac{1}{m_{\infty}}$ NO.  14	5 0.953 0.943 0.934 0.102	6 0.897 0.873 0.867 m <sub>o</sub>	RAKE NO.  2 4 6  /m_\infty =   RAKE NO.	0.104 1 0.902 0.888 0.882 0.938 0.204	2 0.946 0.935 0.939	TUBE 3 0.922 0.951 0.950 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.938 0.917 etting P <sub>2</sub> /P NO. 4	5 0.944 0.951 0.926 = A = 20	6 0.864 0.889 0.857
$\bar{p}_{t,2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t,2}$ RAKE NO.	/pt <sub>w</sub> =  1 0.886 0.893 0.891 2.75 /pt <sub>w</sub> =	0.918 2 0.940 0.951 0.941	TUBE 3 0.928 0.929 0.937 α = TUBE 3 0.908	$1/m_{\infty} = \frac{1}{m_{\infty}}$ NO. $\frac{1}{4}$ 0.935  0.918  0.915  0.00 $1/m_{\infty} = \frac{1}{m_{\infty}}$ NO. $\frac{1}{4}$ 0.958	5 0.953 0.943 0.934 0.102	6 0.897 0.873 0.867 mo	$\begin{array}{c} P_{t_2} = \\ RAKE \\ NO. \\ 2 \\ 4 \\ 6 \\ /m_{\infty} = \\ P_{t_2} = \\ RAKE \\ NO. \\ 2 \\ \end{array}$	0.104 1 0.902 0.888 0.882 0.938 0.204	2 0.946 0.935 0.939 2 0.831	TUBE  3 0.922 0.951 0.950 Exit s  TUBE  3 0.910	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.938 0.917 etting P <sub>2</sub> /P NO.  4 0.956	5 0.944 0.951 0.926 = A = 20	6 0.864 0.889 0.857

$M_{\infty} =$	2 <b>.7</b> 5		_ α =	0.00		_ m <sub>o</sub> /	$m_{\infty} = 1$	0.938	E	xit s∈	etting	= <u>A</u>	
$ar{\mathbf{p}}_{t_{\mathcal{Z}}}$	p <sub>t∞</sub> =	0.816	m <sub>b1</sub>	$/m_{\infty} =$	0.084		t <sub>2</sub> = _	0.335			p <sub>2</sub> /p <sub>o</sub>	<u> </u>	•39
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	<u>}</u>	5	6	NO.	1	2	3	4	5	6
l	0.688	0.706	0.792	0.903	0.955	0.824	2	0.688	0.711	0.790	0.916	0.940	0.821
		0.718						0.688	0.708	0.787	0.891	0.961	0.819
	_	0.713			ľ			0.690	0.715	0.825	0.932	0.942	0.811
	2.75		_ α =					0.938	F	Exit se	etting	= <u>C</u>	
<u>p</u> t2/.	/p <sub>t</sub> =	0.902	5 m <sup>p</sup> ]	$_{\rm L}/{\rm m}_{\infty} =$	0.102		)t2 = .	0.162			p <sub>2</sub> /p <sub>c</sub>	<u> =   20                                </u>	•75
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	74	5	6
1	0.866	0.954	0.962	0.934	0.922	0.852	2	0.816	0.865	0.950	0.958	0.910	0.847
3	0.823	0.877	0.945	0.961	0.927	0.853	14	0.843	0.910	0.957	0.961	0.947	0.862
5		0.903	I 1	1	1		lk I	0.830	0.888	0.949	0.953	0.935	0.825
M <sub>m</sub> =								0.938		Exit s	etting	= <u>C</u>	
								0.248					0.07
- 02	- <sup>-</sup> ∞						02				'		
RAKE			TUBE	MO			1	T					<u> </u>
NO.	1		TODL	NO.			RAKE			TUBE	NO.		
	1	2	3	NO. 4	5	6	RAKE NO.	1	2	TUBE	NO.	5	6
1		2 0 <b>.</b> 918	3	4		<del>                                     </del>	NO.	1		3	4	5	6
3	0.779		3 0•937	4 0.885	0.886	0.784	NO.		0.769	3 0.899	4 0.948	5 0.896	6
	0.779 0.753	0.918	3 0.937 0.915	4 0.885 0.935	0.886 0.888	0.784 0.784	NO. 2	0.742	0.769 0.854	3 0.899 0.937	4 0.948 0.926	5 0.896 0.904	6 0.797 0.791
3 5	0.779 0.753 0.765	0.918 0.808 0.859	3 0.937 0.915 0.953	4 0.885 0.935 0.922	0.886 0.888 0.868	0.784 0.784 0.763	NO. 2 4 6	0.742 0.766	0.769 0.854 0.814	3 0.899 0.937 0.934	0.948 0.926 0.936	5 0.896 0.904 0.880	6 0.797 0.791
3 5 M <sub>∞</sub> =	0.779 0.753 0.765 2.50	0.918 0.808 0.859	3 0.937 0.915 0.953 α =	0.885 0.935 0.922 0.0°	0.886 0.888 0.868	0.784 0.784 0.763	NO.  2  4  6  /m <sub>∞</sub> =	0.742 0.766 0.753 0.851	0.769 0.854 0.814	3 0.899 0.937 0.934	0.948 0.926 0.936 etting	5 0.896 0.904 0.880	6 0.797 0.791 0.763
3 5 M <sub>∞</sub> =	0.779 0.753 0.765 2.50	0.918 0.808 0.859	3 0.937 0.915 0.953 α =	4 0.885 0.935 0.922 0.00 1/m <sub>\infty</sub> =	0.886 0.888 0.868	0.784 0.784 0.763	NO.  2  4  6  /m <sub>∞</sub> =	0.742 0.766 0.753 0.851	0.769 0.854 0.814	3 0.899 0.937 0.934	0.948 0.926 0.936 etting	5 0.896 0.904 0.880 = A	6 0.797 0.791 0.763
$ \begin{array}{c} 3 \\ 5 \end{array} $ $ M_{\infty} = \overline{p}_{t,2} $	0.779 0.753 0.765 2.50	0.918 0.808 0.859	3 0.937 0.915 0.953 α =	4 0.885 0.935 0.922 0.00 1/m <sub>\infty</sub> =	0.886 0.888 0.868	0.784 0.784 0.763	NO. $ \begin{array}{c} 2 \\ 4 \\ 6 \end{array} $ $ /m_{\infty} = \\ p_{t_{2}} = \\ $	0.742 0.766 0.753 0.851	0.769 0.854 0.814	3 0.899 0.937 0.934 Exit s	0.948 0.926 0.936 etting	5 0.896 0.904 0.880 = A	6 0.797 0.791 0.763
$3$ $5$ $M_{\infty} = \overline{p}_{t_{2}}$ RAKE	0.779 0.753 0.765 2.50 /p <sub>t</sub> =	0.918 0.808 0.859	3 0.937 0.915 0.953 α = 1 mb TUBE	14 0.885 0.935 0.922 0.00 1/m <sub>\infty</sub> = NO.	0.886 0.888 0.868 0.14	0.784 0.784 0.763 	NO. $2$ $4$ $6$ $/m_{\infty} =$ $p_{t_2} =$ $RAKE$ NO.	0.742 0.766 0.753 0.851 0.103	0.769 0.854 0.814	3 0.899 0.937 0.934 Exit s	4 0.948 0.926 0.936 etting P <sub>2</sub> /P NO.	5 0.896 0.904 0.880 = A = 1	6 0.797 0.791 0.763
$3$ $5$ $M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	0.779 0.753 0.765 2.50 /p <sub>t</sub> =	0.918 0.808 0.859 0.93	3 0.937 0.915 0.953 α = 1 <sup>m</sup> b TUBE 3 0.953	$\frac{4}{0.885}$ $0.935$ $0.922$ $0.00$ $1/m_{\infty} = \frac{1}{4}$ $0.960$	0.886 0.888 0.868 0.14	0.784 0.784 0.763 	NO.  2 4 6 /m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO.	0.742 0.766 0.753 0.851 0.103	0.769 0.854 0.814 2 0.932	3 0.899 0.937 0.934 Exit s TUBE 3 0.950	4 0.948 0.926 0.936 etting P <sub>2</sub> /P NO.	5 0.896 0.904 0.880 = A = 1	6 0.797 0.791 0.763 4.86 6 0.893

M <sub>∞</sub> =	2.50		- α =	0.0°		_ m <sub>o</sub> /	$m_{\infty} = C$	) <u>.</u> 851	<u>E</u>	Zxit s€	etting	= <u>A</u>	
<u>p</u> t₂/	/p <sub>t</sub> =	0.914	<u> </u>	/m <sub>∞</sub> =	0.112	^p	)t <sub>2</sub> = <u>C</u>	0.128			p <sub>2</sub> /p <sub>o</sub>	o = 14	•19
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.859	0.928	0.962	0.953	0.957	0.861	2	0.848	0.923	0.954	0.941	0.937	0.859
3	0.846	0.923	0.955	0.939	0.937	0.878	4	0.856	0.922	0.959	0.954	0.957	0.867
5						0.870	i	0.847	0.917	0.945	0.939	0.946	0.857
M <sub>∞</sub> =							,	0.851					
			<del></del>				_						
Pt2/	$/p_{t_{\infty}} =$	0.832	m <sub>bl</sub>	$/m_{\infty} =$	0.094		) <sub>t2</sub> = 0	308			. p <sub>2</sub> /p <sub>6</sub>	<sub>∞</sub> = <u>12</u>	2•35
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.704	0.787	0.903	0.923	0.951	0.796	2	0.695	0.736	0.827	0.893	0.930	0.793
3	0.701	0.752	0.865	0.913	0.940	0.804	14	0.702	0.783	0.896	0.937	0.938	0.804
5	0.702	0 <b>.7</b> 53	0.870	0.918	0.929	0.804	6	0.703	0.764	0.884	0.931	0.937	0.778
M <sub>∞</sub> =	2.50		α =	0.00		m <sub>O</sub> /	$m_{\infty} = 0$	0.851		Exit s	etting	= <u>C</u>	
$\mathfrak{p}_{t_{2'}}$	$/p_{t_{\infty}} =$	0.922	m <sub>b</sub> :	$L/m_{\infty} =$	0.103		p <sub>t2</sub> = (	0.109		<u>.</u>	_ p <sub>2</sub> /p <sub>0</sub>	$\infty = \frac{1}{1}$	+.42
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	6
1	0.865	0.926	0.959	0.955	0.957	0.894	2	0.865	0.931	0.957	0.956	0.953	0.859
3	0.862	0.933	0.957	0.957	0.956	0.878	14	0.870	0.927	0.957	0.956	0.960	0.881
5	0.865	0.927	0.954	0.950	0.954	0.872	6	0.860	0.927	0.951	0.946	0.954	0.862
$M_{\infty} =$	2.50		<u>α</u> =	0.00		m <sub>o</sub> ,	$/m_{\infty} = 0$	0.851		Exit s	etting	= <u>C</u>	
<del>-</del>	/p <sub>t</sub> =	0-909	m <sub>h</sub>	/m <sub>~</sub> =	0.086	Δ.	p+_ = 1	0.18 <u>h</u>			p_/p	∞ = <u>1</u>	3.70
- 62	<b>1</b> 0∞	0.702					r 02	1			, -2-,	∞	<u> </u>
	II .		TUBE	NO.		_	RAKE			TUBE	NO.	1	,
RAKE		r	r							r			
RAKE NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	<b></b>	<del> </del>	3	4		6 0.844	<b></b>	<del> </del>	<u> </u>		<del>                                     </del>	<del> </del>	6 0.849
NO.	0.811	0.889	3 0.950	4 0.961	0.970	<del> </del>	2	0.804	<u> </u>	0.938	0.944	0.967	0.849

$M_{\infty} =$	2.50		<u>α</u> =	0.00		_ m <sub>o</sub> /	′m <sub>∞</sub> = _	0.851	F	Exit se	etting	= <u>C</u>	
$\overline{\mathtt{p}}_{t_{\mathcal{S}'}}$	$/p_{t_{\infty}} =$	0.859	<u>m</u> b]	$_{\rm L}/{\rm m}_{\infty} =$	0.075	Δr	) <sub>t2</sub> = _	0.255		<del></del>	p <sub>2</sub> /p <sub>o</sub>	。= <u>12</u>	.81
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	6
1	0 <b>.7</b> 39	0.835	0.938	0.951	0.940	0.805	2	0.732	0.803	0.893	0.936	0.924	0.799
3	0.744	0.836	0.912	0.942	0.933	0.800	4	0.744	0.847	0.930	0.951	0.934	0.796
5	0.740	0.833	0.912	0.940	0.926	0 <b>.7</b> 93	6	0.737	0.824	0.917	0.944	0.937	0.772
	2.25			0.00							etting		
Pt2	/p <sub>t</sub> =	0.949	9 <u>m</u> b:	l/m <sub>∞</sub> =	0.132		) <sub>t2</sub> = (	0.062			_ p <sub>2</sub> /p <sub>c</sub>	<sub>∞</sub> = <u>9</u> .	98
RAKE			TUBE	NO.			RAKE			TUBE	NO.	•	
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.918	0.943	0.959	0.965	0.969	0.948	2	0.912	0.938	0.955	0.966	0.967	0.947
3	0.910	0.940	0.955	0.965	0.965	0.965	<i>λ</i> <sub>+</sub>	0.926	0.946	0.951	0.964	0.965	0.950
5	0.925	0.943	0.952	0.944	0.966	0.946	6	0.927	0.947	0.957	0.962	0.968	0.937
		9 7 . 7	0.77								<u> </u>	<u> </u>	/51
M <sub>∞</sub> =											etting		
	2.25		_ α =	0.00	6499	m <sub>o</sub> /	/m <sub>∞</sub> =	0.738		Exit s		= <u>A</u>	
P̄ <sub>t2</sub>	2.25		$\alpha = \frac{\alpha}{7}$	0.0° 1/m <sub>∞</sub> =	6499	m <sub>o</sub> /	/m <sub>∞</sub> = o <sub>t2</sub> =	0.738		Exit s	etting _ p <sub>2</sub> /p	= <u>A</u>	
	2.25		_ α =	0.0° 1/m <sub>∞</sub> =	6499	m <sub>o</sub> /	/m <sub>∞</sub> =	0.738		Exit s	etting _ p <sub>2</sub> /p	= <u>A</u>	
$\overline{p}_{t_2}$	2.25 /p <sub>t<sub>∞</sub></sub> =	0.93	α = 7 mb  TUBE	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO.	0.117	m <sub>o</sub> ,	$m_{\infty} = 0$	0.738	2	Exit s TUBE	etting p <sub>2</sub> /p <sub>0</sub> NO.	= <u>A</u>	72 6
P <sub>t2</sub> RAKE	2.25 /pt <sub>w</sub> = 1 0.895	0.93°	α = 7	$0.0^{\circ}$ $1/m_{\infty} = 1$ $0.960$	_0.117 	m <sub>o</sub> ,  , △I  6  0.940	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.738 0.087 1 0.887	2	TUBE 3 0.935	P <sub>2</sub> /P <sub>0</sub>	$= A$ $\infty = 9.$ $5$ $0.967$	72 6 0.941
Pt2 RAKE NO.	2.25 /pt <sub>∞</sub> =  1 0.895 0.891	0.93° 2 0.924	α = 7	$0.0^{\circ}$ $1/m_{\infty} = 0.960$ $0.956$	0.117 5 0.968 0.967	m <sub>o</sub> ,  7 △1  6  0.940  0.961	$m_{\infty} = 0$ $m_{\infty$	0.738 0.087 1 0.887 0.894	2 0.907 0.916	TUBE 3 0.935 0.941	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.960	= A	6 0.941 0.940
RAKE NO.	2.25 /pt <sub>w</sub> =  1 0.895 0.891 0.905	0.93° 2 0.924 0.902 0.933	α = 7	$0.0^{\circ}$ $1^{/m}_{\infty} = 0.960$ $0.960$ $0.956$ $0.944$	0.117 5 0.968 0.967 0.965	m <sub>o</sub> ,  6  0.940  0.961  0.941	$m_{\infty} = 0$ $c_{12} = 0$ $c_{12} = 0$ $c_{13} = 0$ $c_{14} = 0$	0.738 0.087 1 0.887 0.894 0.902	2 0.907 0.916 0.935	TUBE 3 0.935 0.941 0.951	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.960 0.956 0.960	= A	6 0.941 0.940 0.930
$\overline{p}_{t_2}$ RAKE NO. $\frac{1}{3}$ $\frac{3}{5}$ $M_{\infty} =$	2.25 /pt <sub>∞</sub> =  1 0.895 0.891 0.905	0.93° 2 0.924 0.902 0.933	$\alpha = \frac{\alpha}{100}$ TUBE  3 0.944 0.927 0.947	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.960$ $0.956$ $0.944$ $0.0^{\circ}$	0.117 5 0.968 0.967 0.965	6 0.940 0.961 0.941	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.738 0.087 1 0.887 0.894 0.902 0.738	2 0.907 0.916 0.935	TUBE 3 0.935 0.941 0.951	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.960 0.956 0.960 etting	= A	6 0.941 0.940 0.930
$\bar{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \bar{p}_{t_2}$	2.25 /pt <sub>w</sub> = 1 0.895 0.891 0.905 2.25	0.93° 2 0.924 0.902 0.933	$\alpha = \frac{\alpha}{100}$ TUBE  3 0.944 0.927 0.947 $\alpha = \frac{\alpha}{100}$	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.960$ $0.956$ $0.944$ $0.0^{\circ}$ $0.0^{\circ}$	0.117 5 0.968 0.967 0.965	6 0.940 0.961 0.941	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$	0.738 0.087 1 0.887 0.894 0.902 0.738	2 0.907 0.916 0.935	TUBE 3 0.935 0.941 0.951	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.960 0.956 0.960 etting	= A	6 0.941 0.940 0.930
$\overline{p}_{t_2}$ RAKE NO. $\frac{1}{3}$ $\frac{3}{5}$ $M_{\infty} =$	2.25 /pt <sub>w</sub> = 1 0.895 0.891 0.905 2.25	0.93° 2 0.924 0.902 0.933	$\alpha = \frac{\alpha}{100}$ TUBE  3 0.944 0.927 0.947	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.960$ $0.956$ $0.944$ $0.0^{\circ}$ $0.0^{\circ}$	0.117 5 0.968 0.967 0.965	6 0.940 0.961 0.941	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.738 0.087 1 0.887 0.894 0.902 0.738	2 0.907 0.916 0.935	TUBE 3 0.935 0.941 0.951 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.960 0.956 0.960 etting	= A	6 0.941 0.940 0.930
$\overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	2.25 /pt <sub>w</sub> =  1 0.895 0.891 0.905 2.25  /pt <sub>w</sub> =	0.93° 2 0.924 0.902 0.933	α = 7  mb  TUBE 3 0.944 0.927 0.947 α = 6  mb  TUBE 3	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.960$ $0.956$ $0.944$ $0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.0^{\circ}$	5 0.968 0.967 0.965	6 0.940 0.941 	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE	0.738 0.087 1 0.887 0.894 0.902 0.738 0.093	2 0.907 0.916 0.935	TUBE  3 0.935 0.941 0.951 Exit s  TUBE	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.960 0.956 0.960 etting P <sub>2</sub> /P NO.	$= A$ $\infty = 9.$ $5$ $0.967$ $0.962$ $= A$ $\infty = 8.$	6 0.941 0.940 0.930
$\overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	2.25 /pt <sub>w</sub> =  1 0.895 0.891 0.905 2.25  /pt <sub>w</sub> =  1 0.863	0.93° 2 0.924 0.902 0.933	α = 7 mb  TUBE 3 0.944 0.927 0.947 α = 6 mb  TUBE 3 0.915	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.960$ $0.956$ $0.944$ $0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $0.904$	0.117 5 0.968 0.967 0.965 0.081	m <sub>o</sub> ,  6  0.940 0.961 0.941  m <sub>o</sub> , Δ;	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.	0.738 0.087 1 0.887 0.894 0.902 0.738 0.093	2 0.907 0.916 0.935 2 0.871	TUBE  3 0.935 0.941 0.951 Exit s  TUBE  3 0.905	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.960 0.960 etting P <sub>2</sub> /P NO.  4	= A	6 0.941 0.940 0.930 77 6 0.837
$\overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1	2.25 /pt <sub>w</sub> =  1 0.895 0.891 0.905 2.25 /pt <sub>w</sub> =  1 0.863 0.841	0.93° 2 0.924 0.902 0.933  0.886	α = 7	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $1/m_{\infty} = 0.960$ $0.956$ $0.944$ $0.0^{\circ}$ $1/m_{\infty} = 0.00$ $1/m_{\infty} = 0.00$ $0.904$ $0.904$ $0.892$	0.117 5 0.968 0.967 0.965 0.915 0.904	m <sub>o</sub> / 6 0.940 0.941 m <sub>o</sub> / Δ: 6 0.885	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.  2  RAKE NO.  2  1  2  1  4	0.738 0.087 1 0.887 0.894 0.902 0.738 0.093	2 0.907 0.916 0.935 2 0.871 0.906	TUBE 3 0.935 0.941 0.951 Exit s TUBE 3 0.905 0.916	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.960 0.956 0.960 etting P <sub>2</sub> /P NO. 4 0.895	= A	72 6 0.941 0.940 0.930 77 6 0.837 0.874

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\overline{p}_{t_2}/p_{t_\infty}$  - Continued (b) 1.50 D inlet without vortex generators

M <sub>∞</sub> =	2.25		<u>α</u> =	0.00		m <sub>o</sub> /	/m <sub>∞</sub> = (	D•738	I	Exit se	etting	= <u>C</u>	
$ar{p}_{t_2}$	/p <sub>t</sub> =	0.940	m <sub>b</sub> ]		0.092		) <sub>t2</sub> = (	0.090			p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = 9.6	53
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.894	0.935	0.957	0.966	0.966	0.929	2	0.892	0.934	0.955	0.967	0.965	0.924
3	0.884	0.927	0.955	0.965	0.964	0.943	4	0.902	0.941	0.951	0.962	0.965	0.927
_ 5	I .	0.940						0.909	1			1	
M <sub>∞</sub> =	2.25		α =	0.00		m <sub>o</sub> /	$m_{\infty} = 0$	0.738	I	Exit se	etting	= C	
							_						
Pt2	$/p_{t_{\infty}} =$	0.922	mb]	$L/m_{\infty} =$	0.074		Pt2 = (	0.109	<del> </del>		. p <sub>2</sub> /p <sub>6</sub>	<sub>∞</sub> = 9.2	25
RAKE			TUBE	NO.			RAKE		·	TUBE	NO.		
NO.	1	2	3	<b>4</b>	5	6	NO.	]	2	3	<u>‡</u>	5	6
1	0.868	0.915	0.943	0.954	0.963	0.909	2	0.865	0.904	0.933	0.948	0.956	0.890
3	0.865	0.896	0.927	0.949	0.957	0.914	4	0.872	0.912	0.945	0.955	0.961	0.905
5	0.873	0.917	0.944	0.938	0.962	0.901	6	0.870	0.921	0.946	0.955	0.965	0.898
M <sub>∞</sub> =	2.25		α =	0.00		m <sub>O</sub> /	$m_{\infty} = 0$	0.738		Exit s	etting	= <u>C</u>	
=													
Pt <sub>2</sub> /	/p <sub>t</sub> =	0.887	<sup>III</sup> b]	L/m <sub>∞</sub> =	0.061	<sup>Δ</sup> ]	p <sub>t2</sub> = (	0.141			p <sub>2</sub> /p	× = 8.5	<del></del>
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.821	0.900	0.916	0.922	0.919	0.879	2	0.808	0.868	0.916	0.926	0.909	0.845
3	0.805	0.854	0.908	0.919	0.920	0.852	4	0.833	0.903	0.920	0.926	0.915	0.870
5	0.854	0.898	0.917	0.894	0.923	0.829	6	0.840	0.909	0.927	0.913	0.930	0.834
M <sub>∞</sub> =	2.00	_	<u>α</u> =	0.00		m <sub>o</sub> ,	$m_{\infty} = \frac{1}{2}$	0.625		Exit s	etting	= <u>A</u>	
Pt2/	$/p_{t_{\infty}} =$	<u>0.958</u>	m <sub>b</sub> :	$_{\rm L}/{\rm m}_{\infty} =$	0.123	^ <u>]</u>	pt2 = (	0.065	·		p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>6.8</u>	31
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.926	0.953	0.960	0.968	0.979	0.961	2	0.927	0.953	0.961	0.963	0.972	0.964
3	0.917	0.947	0.959	0.965	0.975	0.975	) <sub>‡</sub>	1	0.952				
5	l 🗔	0 050	0 067	0.055	0 076	0.960	6	ll .	0.956	i	1		

M <sub>∞</sub> =	2.00		<u>α</u> =	0.00		_ m <sub>o</sub> /	$m_{\infty} = 1$	0.625	I	Exit se	etting	= A	
$\overline{p}_{t_2}$	$/p_{t_{\infty}} =$	0.931	t mpl	$_{\rm L}/{\rm m}_{\infty} =$	0.105	<u> Δ</u>	) <sub>t2</sub> = .	0.091			p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>6.</u>	49
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.892	0.914	0.934	0.959	0.957	0.944	2	0.883	0.896	0.919	0.948	0.968	0.948
3	0.887	0.895	0.913	0.939	0.965	0.959	4	0.896	0.912	0.935	0.960	0.964	0.942
5	1		0.957					0.900	0.920	0.950	0.965	0.961	0.948
M <sub>∞</sub> =	2.00		<u>α</u> =	0.00		m <sub>o</sub> /	$m_{\infty} = 1$	0.625		Exit se	etting	= <u>A</u>	
_	,			,							,		
Pt <sub>2</sub> /	/p <sub>t</sub> =	0.886	<u>m</u> b	$L/m_{\infty} =$	0.085		)t <sub>2</sub> = .	0.121			. p <sub>2</sub> /p <sub>6</sub>	<sub>∞</sub> = <u>5</u> .	.88
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.843	0.863	0.885	0.906	0.919	0.901	2	0.840	0.854	0.874	0.895	0.910	0.905
3	0.835	0.846	0.866	0.884	0.903	0.911	4	0.842	0.853	0.879	0.902	0.920	0.907
				1			1		1			1	
5	0.850	0.866	0.888	0.898	0.928	0.942	6	0.848	0.864	0.890	0.914	0.929	0.930
	0.850 2.00		0.888 _ α =					0.848 0.625				<u> </u>	0.930
M <sub>∞</sub> =	2.00		α =	0.00		m <sub>o</sub> /	/m <sub>∞</sub> = .	0.625			etting	= <u>C</u>	
M <sub>∞</sub> =	2.00			0.00		m <sub>o</sub> /	/m <sub>∞</sub> = .	0.625			etting	<u> </u>	
$M_{\infty} = \overline{p}_{t,2'}$	2.00		α =	$\frac{0.0^{\circ}}{1/m_{\infty}} =$		m <sub>o</sub> /	/m <sub>∞</sub> = .	0.625			etting	= <u>C</u>	
M <sub>∞</sub> =	2.00		$\alpha = \frac{\alpha}{2}$ mb:	$\frac{0.0^{\circ}}{1/m_{\infty}} =$		m <sub>o</sub> /	/m <sub>∞</sub> = .	0.625		Exit s	etting	= <u>C</u>	
$M_{\infty} = \overline{P}_{t,2'}$ RAKE	2.00 /p <sub>t<sub>w</sub></sub> =	0.952	α = 2	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ No.	0.090	m <sub>o</sub> ,	$m_{\infty} = 0$ $t_2 = 0$ RAKE	0.625	2	Exit so	P <sub>2</sub> /P <sub>0</sub>	= <u>C</u> = 6.	6
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	2.00 /p <sub>t</sub> = 1 0.912	0.952 2 0.951	$\alpha = \frac{\alpha}{2}  \text{mb}$ TUBE	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO. $\frac{1}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ 0.971	0.090 5 0.975	m <sub>0</sub> / Δ <sub>I</sub> 6 0.942	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.625	2	TUBE 3 0.963	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.968	=	6 0.945
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	2.00 /pt <sub>w</sub> = 1 0.912 0.899	0.952 2 0.951 0.937	$\alpha = \frac{\alpha}{2} = \frac{m}{b}$ TUBE $\frac{3}{0.962}$	$0.0^{\circ}$ $1/m_{\infty} = $ NO. $1/m_{\infty} = $ NO. $1/m_{\infty} = $ 0.971 0.972	0.090 5 0.975 0.976	6 0.942 0.961	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.625 0.082 1 0.905 0.925	2 0.945 0.952	TUBE 3 0.963	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.968 0.972	= <u>C</u> = <u>6.</u> 5  0.976  0.972	6 0.945
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5	2.00 /pt <sub>w</sub> = 1 0.912 0.899	0.952 2 0.951 0.937 0.960	$\alpha = \frac{\alpha}{2}$ TUBE 3 0.962 0.960	$0.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ $0.971$ $0.972$ $0.955$	0.090 5 0.975 0.976 0.969	6 0.942 0.961 0.929	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.625 0.082 1 0.905 0.925	2 0.945 0.952 0.958	TUBE 3 0.963 0.964 0.968	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.968 0.972	= <u>C</u> = <u>6</u> 5  0.976  0.972  0.975	6 0.945 0.931
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	2.00 /Pt <sub>w</sub> = 1 0.912 0.899 0.928 2.00	0.952 2 0.951 0.937 0.960	α = 2	0.0°  1/m <sub>∞</sub> =  NO.  14  0.971  0.972  0.955  0.0°	0.090 5 0.975 0.976 0.969	6 0.942 0.961 0.929	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.625 0.082 1 0.905 0.925 0.932 0.625	2 0.945 0.952 0.958	TUBE 3 0.963 0.964 0.968	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.968 0.972 0.972 etting	= <u>C</u> = <u>6</u> 5  0.976  0.972  0.975	6 0.945 0.931 0.933
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	2.00 /Pt <sub>w</sub> = 1 0.912 0.899 0.928 2.00	0.952 2 0.951 0.937 0.960	$\alpha = \frac{\alpha}{2}$ TUBE  3  0.962  0.960  0.966 $\alpha = \frac{\alpha}{2}$	$0.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ $0.971$ $0.972$ $0.955$ $0.0^{\circ}$ $1/m_{\infty} =$	0.090 5 0.975 0.976 0.969	6 0.942 0.961 0.929	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 $\frac{1}{4}$ $6$ $m_{\infty} = \frac{1}{2}$	0.625 0.082 1 0.905 0.925 0.932 0.625	2 0.945 0.952 0.958	TUBE 3 0.963 0.964 0.968	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.968 0.972 0.972 etting P <sub>2</sub> /P <sub>0</sub>	= <u>C</u> 5  0.976  0.975  = <u>C</u>	6 0.945 0.931 0.933
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	2.00 /Pt <sub>w</sub> = 1 0.912 0.899 0.928 2.00	0.952 2 0.951 0.937 0.960	$\alpha = \frac{1}{2}$ TUBE  3  0.962  0.960  0.966 $\alpha = \frac{1}{2}$ mb:	$0.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ $0.971$ $0.972$ $0.955$ $0.0^{\circ}$ $1/m_{\infty} =$	0.090 5 0.975 0.976 0.969	6 0.942 0.961 0.929	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.625 0.082 1 0.905 0.925 0.932 0.625	2 0.945 0.952 0.958	TUBE 3 0.963 0.964 0.968 Exit s	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.968 0.972 0.972 etting P <sub>2</sub> /P <sub>0</sub>	= <u>C</u> 5  0.976  0.975  = <u>C</u>	6 0.945 0.931 0.933
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t,2}$	2.00 /pt <sub>w</sub> = 1 0.912 0.899 0.928 2.00 /pt <sub>w</sub> = 1	2 0.951 0.937 0.960	$\alpha = \frac{\alpha}{2}$ TUBE  3  0.962  0.966 $\alpha = \frac{\alpha}{2}$ TUBE	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ $1/m_{\infty} = 0.971$ $0.972$ $0.955$ $0.0^{\circ}$ $1/m_{\infty} = 0.00$ $1/m_{\infty} = 0.00$	0.090 5 0.975 0.976 0.969	6 0.942 0.961 0.929 m <sub>o</sub> /	$m_{\infty} = \frac{1}{2}$ RAKE  NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE	0.625 0.082 1 0.905 0.925 0.932 0.625 0.082	2 0.945 0.952 0.958	TUBE  3 0.963 0.964 0.968 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.968 0.972 0.972 etting P <sub>2</sub> /P <sub>0</sub> NO.  4	=	6 0.945 0.931 0.933
$M_{\infty} = \overline{p}_{t2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t2}$ RAKE NO.	2.00 /pt <sub>w</sub> =  1 0.912 0.899 0.928 2.00 /pt <sub>w</sub> =	0.952 2 0.951 0.937 0.960 0.931 2	α = 2 mb: TUBE 3 0.962 0.960 0.966 α = 4 mb: TUBE 3	$0.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ NO. $1/m_{\infty} =$ $0.972$ $0.955$ $0.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ NO. $1/m_{\infty} =$	0.090 5 0.975 0.976 0.969 5 0.954	m <sub>0</sub> /  6  0.942  0.961  0.929  m <sub>0</sub> /  Δ1	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$	0.625 0.082 1 0.905 0.925 0.932 0.625 0.082	2 0.945 0.952 0.958	TUBE  3 0.963 0.964 0.968 Exit s  TUBE  3 0.935	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.968 0.972 0.972 etting P <sub>2</sub> /P <sub>0</sub> NO.  4 0.956	=	6 0.945 0.931 0.933 ·34 6 0.934

$M_{\infty} =$	2.00		<u>α</u> =	0.00		_ m <sub>o</sub> ,	$m_{\infty} = 1$	0.625	I	Exit se	etting	= <u>C</u>	
₽ <sub>t2</sub>	/p <sub>t∞</sub> =	0.900	m <sub>b</sub> :	$_{\rm L}/{\rm m}_{\infty} =$	0.06	<u>7</u> △1	p <sub>t2</sub> = .	0.123		<del></del>	p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>5</u> .	.91
RAKE			TUBE	NO.			RAKE			TUBE	NO.	-	
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.853	0.874	0.895	0.924	0.942	0.917	2	0.848	0.865	0.890	0.913	0.930	0.923
3	1	0.859				<del> </del>		0.854				<del></del>	
5	0.863	0.885	0.903	0.910	0.955	0.922		0.862					
$M_{\infty} =$								0.521					
												-	
pt2	$/p_{t_{\infty}} =$	0.953	m <sub>b</sub> :	$L/m_{\infty} =$	0.100		)t2 = .	0.053			. p <sub>2</sub> /p <sub>0</sub>	× = 4.5	<u>8</u>
RAKE			TUBE	NO.			RAKE		<u> </u>	TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.932	0.955	0.960	0.965	0.962	0.954	2	0.918	0.946	0.963	0.969	0.962	0.948
3	N 1	0.948						0.939					
5	0.947	0.963	0.957	0.946	0.963	0.944		0.944					
M <sub>∞</sub> =	1.75		α =	0.00		m <sub>O</sub> /		0.521				<u> </u>	
_	,		_	,									
Ptz	/p <sub>t</sub> =	0.937	m <sub>b</sub> ]	$L/m_{\infty} =$	0.092	$^{2}$ $^{\Delta_{I}}$	Pt2 = .	0.062			p <sub>2</sub> /p <sub>c</sub>	- 1.	J. L.
RAKE												× - 4.	. 44
NO.			TUBE	NO.			RAKE			TUBE		×4.	. 44
	1	2	TUBE 3	NO.	5	6	RAKE NO.	1	2	TUBE		» - <u>4</u>	6
1	<del> </del>	2 0.915	3	4			NO.	1	2	3	NO.		6
1 3	0.902	==	3 0.928	4 0.946	0.954	0.938	NO.	1	2 0.923	3 0.941	NO. 4	5	6 0.934
	0.902 0.906	0.915	3 0.928 0.943	0.946 0.956	0.954	0.938 0.932	NO. 2	1 0.903 0.929	2 0.923 0.950	3 0.941 0.949	NO. 4 0.950 0.945	5 0.950	6 0.934 0.917
3 5	0.902 0.906	0.915 0.922 0.958	3 0.928 0.943 0.958	4 0.946 0.956 0.933	0.954 0.949 0.948	0.938 0.932 0.925	NO. 2 4 6	1 0.903 0.929	2 0.923 0.950 0.940	3 0.941 0.949 0.959	NO. 4 0.950 0.945	5 0.950 0.935 0.953	6 0.934 0.917
$\frac{3}{5}$ $M_{\infty} =$	0.902 0.906 0.932 1.75	0.915 0.922 0.958	3 0.928 0.943 0.958 α =	0.946 0.956 0.933 0.0°	0.954 0.949 0.948	0.938 0.932 0.925 m <sub>o/</sub>	NO.  2  4  6  /m <sub>∞</sub> =	1 0.903 0.929 0.921 0.521	2 0.923 0.950 0.940	3 0.941 0.949 0.959	NO. 4 0.950 0.945 0.960 etting	5 0.950 0.935 0.953 = A	6 0.934 0.917 0.928
$\frac{3}{5}$ $M_{\infty} =$	0.902 0.906 0.932	0.915 0.922 0.958	3 0.928 0.943 0.958 α =	0.946 0.956 0.933 0.0°	0.954 0.949 0.948	0.938 0.932 0.925 m <sub>o/</sub>	NO.  2  4  6  /m <sub>∞</sub> =	1 0.903 0.929 0.921 0.521	2 0.923 0.950 0.940	3 0.941 0.949 0.959	NO. 4 0.950 0.945 0.960 etting	5 0.950 0.935 0.953	6 0.934 0.917 0.928
$3$ $5$ $M_{\infty} = \overline{p}_{t,2}$ RAKE	0.902 0.906 0.932 1.75	0.915 0.922 0.958	3 0.928 0.943 0.958 α =	0.946 0.956 0.933 0.0° /m <sub>\infty</sub> =	0.954 0.949 0.948	0.938 0.932 0.925 m <sub>o/</sub>	NO.  2  4  6  /m <sub>∞</sub> =	1 0.903 0.929 0.921 0.521	2 0.923 0.950 0.940	3 0.941 0.949 0.959	NO.  4  0.950  0.945  0.960  etting  P <sub>2</sub> /P <sub>0</sub>	5 0.950 0.935 0.953 = A	6 0.934 0.917 0.928
$\begin{array}{c} 3 \\ 5 \\ M_{\infty} = \\ \bar{p}_{t,2} \end{array}$	0.902 0.906 0.932 1.75	0.915 0.922 0.958	3 0.928 0.943 0.958 α =	0.946 0.956 0.933 0.0° /m <sub>\infty</sub> =	0.954 0.949 0.948	0.938 0.932 0.925 m <sub>o/</sub>	NO. $ \begin{array}{c} 2 \\ 4 \\ 6 \end{array} $ $ \begin{array}{c} m_{\infty} = \\ 2t_{2} = \\ \end{array} $	1 0.903 0.929 0.921 0.521	2 0.923 0.950 0.940	3 0.941 0.949 0.959 Exit se	NO.  4  0.950  0.945  0.960  etting  P <sub>2</sub> /P <sub>0</sub>	5 0.950 0.935 0.953 = A	6 0.934 0.917 0.928
$3$ $5$ $M_{\infty} = \overline{p}_{t,2}$ RAKE	0.902 0.906 0.932 1.75 /p <sub>t<sub>w</sub></sub> =	0.915 0.922 0.958 0.886	3 0.928 0.943 0.958 α = m <sub>b</sub> 3 TUBE	$\frac{1}{0.946}$ $0.956$ $0.933$ $0.0^{\circ}$ $/m_{\infty} = \frac{1}{14}$	0.954 0.949 0.948 0.078	0.938 0.932 0.925 m <sub>o</sub> / 8^I	NO.  2  4  6  /m_  =  Pt_2 =  RAKE  NO.	1 0.903 0.929 0.921 0.521 0.098	2 0.923 0.950 0.940	3 0.941 0.949 0.959 Exit se	NO.  4  0.950  0.945  0.960  etting  p_/p_0  NO.  4	5 0.950 0.935 0.953 = A = 4.	6 0.934 0.917 0.928
$3$ $5$ $M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	0.902 0.906 0.932 1.75 /pt_ =	0.915 0.922 0.958 0.886	3 0.928 0.943 0.958	$^{4}$ $0.946$ $0.956$ $0.933$ $0.0^{\circ}$ $/m_{\infty} =$ $^{1}$ $^{1}$ $^{1}$ $^{2}$ $^{3}$ $^{4}$ $^{4}$ $^{4}$ $^{4}$ $^{4}$	0.954 0.949 0.948 0.078 5 0.905	0.938 0.932 0.925 m <sub>o</sub> / 8 ^1	NO.  2 4 6 /m_  = Pt_2 =  RAKE NO. 2	1 0.903 0.929 0.921 0.521 0.098	2 0.923 0.950 0.940 1	3 0.941 0.949 0.959 Exit se TUBE 3 0.891	NO.  4  0.950  0.945  0.960  etting  p_/p_0  NO.  4  0.906	5 0.950 0.935 0.953 = A = 4.	6 0.934 0.917 0.928 01 6 0.899

$M_{\infty} =$	1.75		<u>α</u> =	0.00		_ m <sub>o</sub> /	m <sub>∞</sub> = <u>·</u>	0.521	E	xit se	etting	= <u>C</u>	
<b>p</b> t₂/	′p <sub>t∞</sub> =	0.957	m <sub>bl</sub>	$/m_{\infty} =$	0.077		t2 = <u> </u>	0.067	<del> </del>		p <sub>2</sub> /p <sub>o</sub>	= 4.5	51
RAKE			TUBE	NO.			RAKE	_		TUBE	NO.		- 1
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.929	0.957	0.958	0.976	0.975	0.948	2	0.922	0.960	0.956	0.969	0.980	0.959
3		0.950						0.934	0.960	0.961	0.974	0.974	0.944
5	0.931	0.957	0.966	0.963	0.973	0.955	6	0.919	0.952	0.967	0.980	0.977	0.945
M <sub>∞</sub> =	1.75		_ α =	0.00		_ m <sub>o</sub> /	$m_{\infty} = 1$	0.521	F	Exit se	etting	= <u>C</u>	
<b>□</b> + _/	/ <sub>p+</sub> =	0.932	m <sub>h 1</sub>	/m_ =	0.069	Δμ	)+ c =	0.067			p <sub>3</sub> /p <sub>3</sub>	o = 4.	30
	- 000									TUBE		·	
RAKE NO.	1	2	TUBE 3	4	5	6	RAKE NO.	1	2	3	4	5	6
1		0.918					2					0.959	
3	<del></del>	0.910					-					0.926	
<u> </u>		<del></del>			0.940						0.960		-
5	11 () • (4)	1 () • 7 ) )											
5 M -		·						Ц			<u> </u>		
<u> </u>	1.75	·	<u>α =</u>					0.521			<u> </u>		
M <sub>∞</sub> =	1.75	·	<u> </u>	0.00		m <sub>o</sub> /	/ <sub>m</sub> = .	0.521		Exit s	etting		
$M_{\infty} = \overline{p}_{t_2}$	1.75		$\alpha = \frac{\alpha}{m_{b}}$	$\frac{0.0^{\circ}}{1/m_{\infty}} =$		m <sub>o</sub> /	/m <sub>∞</sub> =	0.521		Exit s	etting	= <u>C</u>	
M <sub>∞</sub> =	1.75		<u> </u>	$\frac{0.0^{\circ}}{1/m_{\infty}} =$		m <sub>o</sub> /	/ <sub>m</sub> = .	0.521		Exit s	etting	= <u>C</u>	
$M_{\infty} = \overline{p}_{t_2}$	1.75 /p <sub>t</sub> =	0.895	$\alpha = \frac{m_{b1}}{1000}$	$\frac{0.0^{\circ}}{1/m_{\infty}} = \frac{NO.}{1}$	0.061	m <sub>o</sub> ,	/m <sub>∞</sub> = ot <sub>2</sub> = RAKE	0.521	2	Exit so	P <sub>2</sub> /P <sub>0</sub>	$= \frac{C}{\infty}$	98
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1.75 /pt <sub>w</sub> =	0.895	$\alpha = \frac{\alpha}{1000}$ TUBE 3 0.891	$0.0^{\circ}$ $1/m_{\infty} = 0.0^{\circ}$ NO. $1/m_{\infty} = 0.0^{\circ}$	0.061 5 0.926	m <sub>0</sub> , Δ] 6 0.897	$m_{\infty} = 0$ $t_2 = 0$ RAKE NO.	0.521 0.099 1 0.875	2	TUBE 3 0.892	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.912	$= \frac{C}{\infty} = \frac{3}{4}$	98 6 0.901
$M_{\infty} = \overline{p}_{t_2}$ RAKE	1.75 /pt <sub>w</sub> = 1 0.865 0.860	0.895 2 0.880	$\alpha = \frac{m_{b1}}{1000}$ TUBE 3 0.891 0.879	$0.0^{\circ}$ $1/m_{\infty} =$ NO.  14  0.911  0.894	0.061 5 0.926 0.903	m <sub>o</sub> , Δ <sub>1</sub> 6 0.897 0.893	/m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO. 2	0.521 0.099 1 0.875 0.866	2 0.882 0.878	TUBE 3 0.892 0.896	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.912	$= \underline{C}$ $\infty = \underline{3}.$ $5$ $0.932$	98 6 0.901 0.896
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1.75 /pt <sub>w</sub> =  1 0.865 0.860 0.869	0.895 2 0.880 0.868	$\alpha = \frac{m_{b1}}{1000}$ TUBE 3 0.891 0.879 0.902	$0.0^{\circ}$ $1/m_{\infty} =$ NO.  14  0.911  0.894  0.903	0.061 5 0.926 0.903 0.949	m <sub>o</sub> , Δ <sub>1</sub> 6 0.897 0.893	/m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO. 2 4	0.521 0.099 1 0.875 0.866 0.864	2 0.882 0.878 0.873	TUBE 3 0.892 0.896 0.890	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.912	$= \frac{C}{3}$ $= \frac{3}{3}$ $0.932$ $0.930$ $0.921$	98 6 0.901 0.896
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	1.75 /pt_ =  1 0.865 0.860 0.869	0.895 2 0.880 0.868 0.884	$\alpha = \frac{m_{b1}}{1000}$ TUBE 3 0.891 0.879 0.902	0.0° 1/m <sub>∞</sub> =  NO.  4  0.911  0.894  0.903  0.0°	0.061 5 0.926 0.903 0.949	6 0.897 0.893 0.926	$m_{\infty} = 0$ $p_{t_2} = 0$ $p_{t_2} = 0$ $p_{t_3} = 0$ $p_{t_4} = 0$ $p_{t_4} = 0$ $p_{t_6} = 0$ $p_{t_6} = 0$	0.521 0.099 1 0.875 0.866 0.864	2 0.882 0.878 0.873	TUBE 3 0.892 0.896 0.890	P2/P0 NO. 4 0.912 0.909 etting	$= \frac{C}{3}$ $= \frac{3}{3}$ $0.932$ $0.930$ $0.921$	98 6 0.901 0.896 0.892
$M_{\infty} = \overline{p}_{t2}$ $RAKE$ $NO.$ $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t2}$	1.75 /pt_ =  1 0.865 0.860 0.869	0.895 2 0.880 0.868 0.884	$\alpha = \frac{m_{b}}{1000}$ TUBE  3  0.891  0.879  0.902 $\alpha = \frac{m_{b}}{1000}$	$0.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.911  0.894  0.903  0.0° $1/m_{\infty} =$	0.061 5 0.926 0.903 0.949	6 0.897 0.893 0.926	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$	0.521 0.099 1 0.875 0.866 0.864	2 0.882 0.878 0.873	TUBE 3 0.892 0.896 0.890	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.912 0.909 etting P <sub>2</sub> /P	= <u>C</u> = <u>3.</u> 5  0.932  0.930  0.921  = A	98 6 0.901 0.896 0.892
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	1.75 /pt_ =  1 0.865 0.860 0.869	0.895 2 0.880 0.868 0.884	$\alpha = \frac{m_{b1}}{1000}$ TUBE 3 0.891 0.879 0.902	$0.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.911  0.894  0.903  0.0° $1/m_{\infty} =$	0.061 5 0.926 0.903 0.949	6 0.897 0.893 0.926	$m_{\infty} = 0$ $p_{t_2} = 0$ $p_{t_2} = 0$ $p_{t_3} = 0$ $p_{t_4} = 0$ $p_{t_4} = 0$ $p_{t_6} = 0$ $p_{t_6} = 0$	0.521 0.099 1 0.875 0.866 0.864	2 0.882 0.878 0.873	TUBE 3 0.892 0.896 0.896	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.912 0.909 etting P <sub>2</sub> /P	= <u>C</u> = <u>3.</u> 5  0.932  0.930  0.921  = A	98 6 0.901 0.896 0.892
$M_{\infty} = \overline{p}_{t_2}$ $RAKE$ $NO.$ $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t_2}$ $RAKE$	1.75  /pt_ =  1  0.865  0.860  0.869  1.55	0.895 2 0.880 0.868 0.884	$\alpha = \frac{m_{b}}{m_{b}}$ TUBE  3  0.891  0.879  0.902 $\alpha = \frac{m_{b}}{m_{b}}$ TUBE	$0.0^{\circ}$ $1/m_{\infty} = 1$	0.061 5 0.926 0.903 0.949	6 0.897 0.893 0.926 	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.	0.521 0.099 1 0.875 0.866 0.864 0.466	2 0.882 0.878 0.873	TUBE 3 0.892 0.896 0.890 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.909 etting P <sub>2</sub> /P NO.		98 6 0.901 0.896 0.892
$M_{\infty} = \overline{p}_{t2}$ $RAKE$ $NO.$ $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t2}$ $RAKE$ $NO.$	1.75  /Ft <sub>w</sub> =  1 0.865 0.860 0.869  1.55  /Pt <sub>w</sub> =	0.895 2 0.880 0.868 0.884	$\alpha = \frac{m_{b}}{m_{b}}$ TUBE  3  0.891  0.879  0.902 $\alpha = \frac{m_{b}}{m_{b}}$ TUBE  3  0.957	$0.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.911  0.894  0.903  0.0° $1/m_{\infty} =$ NO.  4  0.958	0.061 5 0.926 0.903 0.949 0.106	6 0.897 0.893 0.926	$m_{\infty} = \frac{1}{2}$ RAKE NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE NO.  2	0.521 0.099 1 0.875 0.866 0.864 0.466 0.052	2 0.882 0.878 0.873	TUBE 3 0.892 0.896 0.890 Exit s TUBE 3 0.958	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.909 etting P <sub>2</sub> /P NO.  4 0.956	$= \frac{C}{\infty} = \frac{3.0}{3.0}$ $0.932$ $0.930$ $0.921$ $= \frac{A}{\infty} = \frac{3.0}{3.0}$ $0.959$	98 6 0.901 0.896 0.892 54
$M_{\infty} = \overline{p}_{t_2}$ $RAKE$ $NO.$ $1$ $3$ $5$ $M_{\infty} = \overline{p}_{t_2}$ $RAKE$ $NO.$	1.75  /pt_ =  1  0.865  0.860  0.869  1.55  /pt_ =  1  0.980  0.982	0.895 2 0.880 0.868 0.966 2 0.973	α =  "b: TUBE  3 0.891 0.879 0.902  α =  "b: TUBE 3 0.957 0.960	$0.0^{\circ}$ $1/m_{\infty} =$ NO. $4$ $0.911$ $0.894$ $0.903$ $0.0^{\circ}$ $1/m_{\infty} =$ NO. $4$ $0.958$ $0.958$	0.061 5 0.926 0.903 0.949  0.106	6 0.897 0.893 0.926	/m <sub>∞</sub> =   Pt <sub>2</sub> =   RAKE   NO.   2	0.521 0.099 1 0.875 0.866 0.864 0.466 0.052	2 0.882 0.878 0.873 2 0.982 0.979	TUBE  3 0.892 0.896 0.896  TUBE 3 0.958 0.960	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.912 0.909 etting P <sub>2</sub> /P NO.  4 0.956	$= \frac{C}{\infty} = \frac{3.0}{3.0}$ $= \frac{3.0}{0.932}$ $= \frac{A}{0.921}$ $= \frac{A}{0.959}$ $= \frac{5}{0.959}$ $= \frac{3.0}{0.962}$	98 6 0.901 0.896 0.892 54 6 0.958

M <sub>∞</sub> =	1.55		_ α =	0.0°		_ m <sub>o</sub> /	′m <sub>∞</sub> = <u>C</u>	.466	E	Exit s∈	etting	= A	<u>-</u>
	/p <sub>t</sub> =	0.969	m <sub>bl</sub>	_/m <sub>∞</sub> =	0.092		)t <sub>2</sub> = <u>C</u>	.061			p <sub>2</sub> /p <sub>o</sub>	s = <u>3.4</u>	5
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	_ 6
1	0.926	0.960	0.978	0.984	0.983	0.974	2	0.932	0.962	0.982	0.983	0.984	0.974
3	0.930	0.962	0.976	0.983	0.983	0.981	4	0.932	0.964	0.983	0.984	0.984	0.973
5	0.931	0.967	0.980	0.965	0.981	0.979	6	0.935	0.970	0.985	0.983	0.979	0.972
M <sub>∞</sub> =			_ α =				,	.466	F	Exit se	etting	= A	
p̄t2/	$/p_{t_{\infty}} =$	0.869	m <sub>b</sub> ]	$m_{\infty} =$	0.059		)t <sub>2</sub> = (	0.088		<del></del>	p <sub>2</sub> /p <sub>c</sub>	° = 5.8	31
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	14	5	6
1	0.832	0.840	0.853	0.870	0.889	0.869	2	0.845	0.854	0.870	0.885	0.902	0.868
3	0.839	0.852	0.866	0.878	0.896	0,890	4	0.836	0.841	0.857	0.871	0.888	0.870
5	0.848	0.863	0.874	0.874	0.907	0.896	6	0.848	0.862	0.875	0.890	0.908	0.876
M <sub>∞</sub> =	1.55		α =	0.00		m <sub>O</sub> /	$m_{\infty} = 0$	0.466	I	Exit s	etting	= C	
Pt2	$/p_{t_{\infty}} =$	0.974	<sup>m</sup> bi	$L/m_{\infty} =$	0.081	<sup>△</sup> I	p <sub>t2</sub> = (	0.049			. p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>3.5</u>	53
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4		6	NO.	1					
1						<u> </u>		1	2	3	4	5	6
	0.974	0.994	0.971	0.967				<u> </u>	2 0.997				
3	<del> </del>		0.971		0.967	0.963	2	0.979		0.981	0.967	0.966	0.962
<u>3</u> 5	0.973	0.996		0.969	0.967 0.967	0.963 0.966	2	0.979 0.978	0.997	0.981	0.967 0.968	0.966 0.968	0.962 0.964
5	0.973	0.996	0.982	0.969	0.967 0.967 0.966	0.963 0.966 0.966	2	0.979 0.978 0.988	0.997 0.996 0.993	0.981 0.981 0.972	0.967 0.968	0.966 0.968 0.967	0.962 0.964
5 M <sub>∞</sub> =	0.973 0.980 1.55	0.996	0.982 0.973 α =	0.969 0.949 0.0°	0.967 0.967 0.966	0.963 0.966 0.966	2 4 6 /m <sub>∞</sub> =	0.979 0.978 0.988 0.466	0.997 0.996 0.993	0.981 0.981 0.972	0.967 0.968 0.966 etting	0.966 0.968 0.967 = C	0.962 0.964 0.961
5 M <sub>∞</sub> =	0.973 0.980	0.996	0.982 0.973 α =	0.969 0.949 0.0°	0.967 0.967 0.966	0.963 0.966 0.966	2 4 6 /m <sub>∞</sub> =	0.979 0.978 0.988 0.466	0.997 0.996 0.993	0.981 0.981 0.972	0.967 0.968 0.966 etting	0.966 0.968 0.967	0.962 0.964 0.961
5 M <sub>∞</sub> =	0.973 0.980 1.55	0.996	0.982 0.973 α =	$0.969$ $0.949$ $0.0^{\circ}$ $1/m_{\infty} =$	0.967 0.967 0.966	0.963 0.966 0.966	2 4 6 /m <sub>∞</sub> =	0.979 0.978 0.988 0.466	0.997 0.996 0.993	0.981 0.981 0.972	0.967 0.968 0.966 etting p <sub>2</sub> /p	0.966 0.968 0.967 = C	0.962 0.964 0.961
$M_{\infty} = \overline{p}_{t_2}$	0.973 0.980 1.55	0.996	0.982 0.973 α =	$0.969$ $0.949$ $0.0^{\circ}$ $1/m_{\infty} =$	0.967 0.967 0.966	0.963 0.966 0.966	$\begin{array}{c} 2 \\ 4 \\ 6 \\ m_{\infty} = \end{array}$	0.979 0.978 0.988 0.466	0.997 0.996 0.993	0.981 0.981 0.972 Exit s	0.967 0.968 0.966 etting p <sub>2</sub> /p	0.966 0.968 0.967 = C	0.962 0.964 0.961
$ \begin{array}{c} 5 \\ M_{\infty} = \\ \overline{p}_{t_2} \\ \end{array} $ RAKE	0.973 0.980 1.55 /p <sub>t</sub> =	0.996 0.995 0.898	0.982 0.973 α = mb	$0.969$ $0.949$ $0.0^{\circ}$ $1/m_{\infty} = $ NO.	0.967 0.966 0.966	0.963 0.966 0.966 m <sub>o</sub> ,	$\begin{array}{c} 2 \\ 4 \\ 6 \\ m_{\infty} = \end{array}$ $\begin{array}{c} Pt_2 = \\ RAKE \\ NO. \end{array}$	0.979 0.978 0.988 0.466 0.075	0.997	0.981 0.972 Exit s	0.967 0.968 0.966 etting p <sub>2</sub> /p <sub>0</sub> NO.	0.966 0.968 0.967 = C	0.962 0.964 0.961
$M_{\infty} = \frac{\overline{p}_{t_2}}{RAKE}$	0.973 0.980 1.55 /p <sub>t</sub> = 1 0.871	0.996 0.995 0.898 2 0.887	0.982 0.973 α = mb TUBE	$0.969$ $0.949$ $0.0^{\circ}$ $1/m_{\infty} = 0.914$	0.967 0.966 0.049 5 0.920	0.963 0.966 0.966 	2 4 6 /m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO.	0.979 0.978 0.988 0.466 0.075	0.997	0.981 0.972 Exit s TUBE 3 0.901	0.967 0.968 0.966 etting p <sub>2</sub> /p <sub>2</sub> NO. 4	0.966 0.968 0.967 = C = 2.9	0.962 0.964 0.961 93 6 0.897

M <sub>∞</sub> =	3.00		<u>α</u> =	2.0°		_ m <sub>o</sub> /	$m_{\infty} = 1$		F	Exit se	etting	= <u>A</u>	
₱t₂/	/p <sub>t</sub> =	0.882	mb]	_/m <sub>∞</sub> =	0.128		o <sub>t2</sub> = (	0.178			p <sub>2</sub> /p <sub>o</sub>	<sub>∞</sub> = <u>30</u>	61
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	_ 3	4	5	6	NO.	1	2	3	14	5	6
1	0.809	0.806	0.829	0.874	0.934	0.898	2	0.838	0.882	0.923	0.949	0.963	0.862
3	0.844	0.888	0.938	0.950	0.876	0.834	4	0.872	0.933	0.889	0.831	0.814	0.814
5	0.843	0.884	0.932	0.953	0.903	0.841	6	0.822	0.851	0.899	0.945	0.954	0.859
M <sub>∞</sub> =	3.00		_ α =	2.00		_ m <sub>o</sub> /	$m_{\infty} = 1$		F	Exit se	etting	= <u>C</u>	_
Pt2	/p <sub>t∞</sub> =	0.873	m <sub>b</sub> _	$/m_{\infty} =$	0.101		o <sub>t2</sub> = (	0.187			. p <sub>2</sub> /p <sub>c</sub>	<sub>∞</sub> = <u>30.</u>	18
RAKE		,	TUBE	NO.			RAKE			TUBE	NO.	<b>-</b>	
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	- 6
1	0.798	0.808	0.859	0.925	0.947	0.874	2	0.824	0.868	0.917	0.951	0.944	0.847
3	0.825	0.882	0.946	0.911	0.828	0.805	4	0.832	0.922	0.921	0.873	0.806	0.795
5	0.812	0.857	0.938	0.937	0.860	0.811	6	0.814	0.843	0.907	0.958	0.931	0.841
M <sub>∞</sub> =	2.75		_ α =	2.0°		m <sub>o</sub> /	$m_{\infty} = 1$		I	Exit s	etting	= A	
$\overline{p}_{t_{2'}}$	/p <sub>t</sub> , =	0.907	m <sub>b</sub> :	$_{\rm L}/{\rm m}_{\infty}$ =	0.127	^j	p <sub>t2</sub> =	0.142			p <sub>2</sub> /p <sub>c</sub>	= 21.	. 30
RAKE												xo	
NO.			TUBE	NO.			RAKE			TUBE	NO.	×	
<b>.</b>	1	2	TUBE 3	NO.	5	6	RAKE NO.	1	2	TUBE	NO.	5	6
1	<u> </u>	2 0 <b>.</b> 903	3	4			NO.			3		5	6
1 3	0.869		3 0.932	4 0.945	0.946	0.878	NO.	0.874	0.928	3 0.920	4	5 0.950	6 0.854
	0.869	0.903	3 0.932 0.916	4 0.945 0.930	0.946	0.878 0.889	NO. 2	0.874 0.833	0.928 0.869	3 0.920 0.907	4 0.931	5 0.950 0.962	6 0.854 0.879
3 5	0.869 0.852 0.851	0.903 0.908	3 0.932 0.916 0.913	4 0.945 0.930 0.920	0.946 0.957 0.956	0.878 0.889 0.883	NO. 2 4 6	0.874 0.833	0.928 0.869 0.918	3 0.920 0.907 0.930	0.931 0.933 0.935	5 0.950 0.962 0.943	6 0.854 0.879
3 5 M <sub>∞</sub> =	0.869 0.852 0.851 2.75	0.903 0.908 0.916	3 0.932 0.916 0.913 α =	4 0.945 0.930 0.920 2.0°	0.946 0.957 0.956	0.878 0.889 0.883	NO. $2$ $4$ $6$ $m_{\infty} =$	0.874 0.833 0.869	0.928 0.869 0.918	3 0.920 0.907 0.930	0.931 0.933 0.935 etting	5 0.950 0.962 0.943	6 0.854 0.879 0.855
$3$ $5$ $M_{\infty} = \overline{p}_{t_{2'}}$ $RAKE$	0.869 0.852 0.851 2.75	0.903 0.908 0.916	3 0.932 0.916 0.913 α =	4 0.945 0.930 0.920 2.0° 1/m <sub>∞</sub> =	0.946 0.957 0.956	0.878 0.889 0.883	NO. $2$ $4$ $6$ $m_{\infty} =$	0.874 0.833 0.869	0.928 0.869 0.918	3 0.920 0.907 0.930	0.931 0.933 0.935 etting P <sub>2</sub> /P <sub>0</sub>	5 0.950 0.962 0.943 = C	6 0.854 0.879 0.855
$\frac{3}{5}$ $M_{\infty} = \overline{p}_{t_{2}}$	0.869 0.852 0.851 2.75	0.903 0.908 0.916	3 0.932 0.916 0.913 α =	4 0.945 0.930 0.920 2.0° 1/m <sub>∞</sub> =	0.946 0.957 0.956	0.878 0.889 0.883	NO. $\begin{array}{c} 2 \\ 4 \\ 6 \end{array}$	0.874 0.833 0.869	0.928 0.869 0.918	3 0.920 0.907 0.930 Exit s	0.931 0.933 0.935 etting P <sub>2</sub> /P <sub>0</sub>	5 0.950 0.962 0.943 = C	6 0.854 0.879 0.855
$3$ $5$ $M_{\infty} = \overline{p}_{t_{2'}}$ $RAKE$	0.869 0.852 0.851 2.75 /p <sub>t</sub> =	0.903 0.908 0.916 0.890	3 0.932 0.916 0.913 α = mb: TUBE	$\frac{4}{0.945}$ $0.930$ $0.920$ $2.0^{\circ}$ $1/m_{\infty} = \frac{4}{4}$	0.946 0.957 0.956 0.098	0.878 0.889 0.883 	NO.  2  4  6 $m_{\infty} =$ Pt <sub>2</sub> =  RAKE  NO.	0.874 0.833 0.869 	0.928 0.869 0.918	3 0.920 0.907 0.930 Exit s	4 0.931 0.933 0.935 etting p <sub>2</sub> /p <sub>0</sub>	5 0.950 0.962 0.943 = C = 20	6 0.854 0.879 0.855
$\begin{array}{c} 3 \\ 5 \\ M_{\infty} = \\ \overline{p}_{t,2} \\ \\ \text{RAKE} \\ \text{NO.} \end{array}$	0.869 0.852 0.851 2.75 /p <sub>t</sub> =	0.903 0.908 0.916 0.890	3 0.932 0.916 0.913 α = mb: TUBE 3 0.933	$\frac{4}{0.945}$ $0.945$ $0.920$ $2.0^{\circ}$ $1/m_{\infty} = \frac{1}{4}$ $0.942$	0.946 0.957 0.956 0.098 5 0.942	0.878 0.889 0.883 	NO. $ \begin{array}{c} 2 \\ 4 \\ 6 \end{array} $ $ \begin{array}{c} 6 \\ \end{array} $ Pt <sub>2</sub> = $ \begin{array}{c} RAKE \\ NO. \end{array} $	0.874 0.833 0.869 	0.928 0.869 0.918 2 0.844	3 0.920 0.907 0.930 Exit s TUBE 3 0.919	4 0.931 0.933 0.935 etting P <sub>2</sub> /P <sub>0</sub> NO.	5 0.950 0.962 0.943 = <u>C</u> = 20 5 0.934	6 0.854 0.879 0.855 .57 6 0.874

M <sub>∞</sub> =	2.50		<u>α</u> =	2.00		_ m <sub>O</sub> /	/m <sub>∞</sub> = .		F	Exit se	etting	= <u>A</u>	
Pt2	/p <sub>t∞</sub> =	0.92	7mb]	L/m <sub>∞</sub> =	0.138	3	o <sub>t2</sub> = _	<b>0.07</b> 8			p <sub>2</sub> /p <sub>0</sub>	∞ = <u>1</u> 1	··83
RAKE			TUBE	NO.			RAKE			TUBE	NO.		-
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.903	0.920	0.925	0.940	0.948	0.909	2	0.895	0.929	0.935	0.948	0.952	0.901
3	0.888	0.942	0.952	0.938	0.947	0.899	4	0.903	0.932	0.949	0.955	0.961	0.909
5	0.898	0.938	0.946	0.940	0.950	0.901	6	0.889	0.918	0.929	0.947	0.948	0.895
M <sub>∞</sub> =	2.50		<u>α</u> =	2.00		m <sub>o</sub> /	,		I	Exit s	etting	= <u>C</u>	
₽t2/	$/p_{t_{\infty}} =$	0.918	3m <sub>b</sub>	$_{\rm L}/{\rm m}_{\infty}$ =	0.099	9∆ <sub>I</sub>	)t <sub>2</sub> = .	0.135			. p <sub>2</sub> /p	<sub>∞</sub> = <u>1</u> 1	1.42
RAKE		<del> </del>	TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.887	0.924	0.929	0.942	0.949	0.889	2	0.881	0.932	0.947	0.947	0.953	0.863
3		0.910		•				0.843	0.886	0.933	0.964	0.960	0.900
5	0.858	0.917	0.960	0.948	0.949	0.881	6	0.870	0.921	0.937	0.945	0.952	0.865
M <sub>∞</sub> =	2.25		α =	2.0°		m	/m <sub>∞</sub> =		I	Exit s	etting	= A	
											_		
- 62		$- \circ \circ$	ე m <sub>h</sub> .	$_{1}/m_{\infty} =$	0.120	o ∆1	0+ =	0.147			q/q	= Q	8 <b>7</b>
	<sup>′ - T</sup> ∞	0.940	<u>D</u> <sup>m</sup> b:	l/m <sub>∞</sub> =	0.129	<u>-</u> Δ]	pt2 = .	0.147			p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>9</u> .	.87
RAKE	, <sub>1</sub> , ∞	0.940	O mb:		0.129		RAKE	}		TUBE	-	<sub>∞</sub> = <u>9</u> .	87
RAKE NO.	1	2			0.129 5	6	1	}	2	· · · · · · · · · · · · · · · · · · ·	-	<sub>∞</sub> = <u>9</u> .	.8 <b>7</b> 6
	1		TUBE 3	NO.	5	6	RAKE NO.	1	2	TUBE	NO.	1	6
NO.	1	2	TUBE 3 0.941	NO. 4	5 <b>0.95</b> 8	6 0.930	RAKE NO.	1 0.918	2 0•944	TUBE 3 0.956	NO. 4	5	6 0 <b>.</b> 945
NO.	1 0.923 0.903	2 0.946	TUBE 3 0.941 0.933	NO. 4 0.953 0.938	5 0.958 0.944	6 0.930 0.934	RAKE NO. 2	1 0.918 0.895	2 0.944 0.913	TUBE 3 0.956 0.934	NO. 4 0.951 0.952	5 0.962	6 0•945 0•946
NO.  1  3  5	1 0.923 0.903	2 0.946 0.920	TUBE 3 0.941 0.933 0.956	NO. 4 0.953 0.938	5 0.958 0.944 0.966	6 0.930 0.934 0.958	RAKE NO. 2 4	1 0.918 0.895	2 0.944 0.913 0.945	TUBE 3 0.956 0.934 0.950	NO. 4 0.951 0.952	5 0.962 0.963 0.961	6 0.945 0.946
NO. $\frac{1}{3}$ $\frac{5}{M_{\infty}} =$	1 0.923 0.903 0.913 2.25	2 0.946 0.920	TUBE 3 0.941 0.933 0.956 α =	NO. 4 0.953 0.938 0.942 2.0°	5 0.958 0.944 0.966	6 0.930 0.934 0.958	RAKE NO. 2 4 6	1 0.918 0.895 0.916	2 0.944 0.913 0.945	TUBE 3 0.956 0.934 0.950	NO.  4  0.951  0.952  0.955  etting	5 0.962 0.963 0.961	6 0.945 0.946 0.930
NO. $\frac{1}{3}$ $\frac{5}{M_{\infty}} =$	1 0.923 0.903 0.913 2.25	2 0.946 0.920 0.940	TUBE 3 0.941 0.933 0.956 α =	NO. 4 0.953 0.938 0.942 2.00	5 0.958 0.944 0.966	6 0.930 0.934 0.958	RAKE NO. 2 4 6	1 0.918 0.895 0.916	2 0.944 0.913 0.945	TUBE 3 0.956 0.934 0.950	NO.  4  0.951  0.952  0.955  etting  P <sub>2</sub> /P <sub>0</sub>	5 0.962 0.963 0.961 = C	6 0.945 0.946 0.930
NO. $ \begin{array}{c} 1 \\ 3 \\ 5 \end{array} $ $ M_{\infty} = \overline{p}_{t,2} $	1 0.923 0.903 0.913 2.25	2 0.946 0.920 0.940	TUBE 3 0.941 0.933 0.956 α = 0 mb:	NO. 4 0.953 0.938 0.942 2.00	5 0.958 0.944 0.966	6 0.930 0.934 0.958	RAKE NO. 2 4 6 6 /m <sub>∞</sub> =	1 0.918 0.895 0.916	2 0.944 0.913 0.945	TUBE 3 0.956 0.934 0.950 Exit s	NO.  4  0.951  0.952  0.955  etting  P <sub>2</sub> /P <sub>0</sub>	5 0.962 0.963 0.961 = C	6 0.945 0.946 0.930
NO. $\frac{1}{3}$ $5$ $M_{\infty} = \bar{p}_{t,2}$ RAKE	1 0.923 0.903 0.913 2.25 /pt <sub>\inftit{\text{\text{\$\text{\$p\$}}}}</sub>	2 0.946 0.920 0.940	TUBE  3 0.941 0.956 α = 0 mb: TUBE 3	NO.  4  0.953  0.938  0.942  2.0° $1/m_{\infty} =$ NO.  4	5 0.958 0.944 0.966	6 0.930 0.934 0.958 m <sub>o</sub> ,	RAKE NO. 2 4 6 $m_{\infty} =$ Pt <sub>2</sub> = RAKE NO.	1 0.918 0.895 0.916 0.093	2 0.944 0.913 0.945	TUBE  3 0.956 0.934 0.950 Exit services TUBE 3	NO.  4  0.951  0.952  0.955  etting  P <sub>2</sub> /P <sub>0</sub> NO.  4	5 0.962 0.963 0.961 = C	6 0.945 0.946 0.930
NO. $\frac{1}{3}$ $\frac{5}{5}$ $M_{\infty} = \frac{\bar{p}_{t,2}}{2}$ RAKE NO.	1 0.923 0.903 0.913 2.25 /p <sub>t</sub> =	2 0.946 0.920 0.940	TUBE  3 0.941 0.933 0.956 α =	NO.  4  0.953  0.938  0.942  2.0° $1/m_{\infty} =$ NO.  4  0.958	5 0.958 0.944 0.966 0.093	6 0.930 0.934 0.958 m <sub>o</sub> / 3 ^j	RAKE NO. 2 4 6 /m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO.	1 0.918 0.895 0.916 	2 0.944 0.913 0.945	TUBE 3 0.956 0.934 0.950 Exit s TUBE 3 0.946	NO.  4  0.951  0.952  0.955  etting  P <sub>2</sub> /P <sub>0</sub> NO.  4  0.952	5 0.962 0.963 0.961 = C	6 0.945 0.946 0.930 .42 6 0.930

#### TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA, $\overline{p}_{t_2}/p_{t_\infty}$ - Continued

(b) 1.50 D inlet without vortex generators

$M_{\infty} =$	2.00		- α =	2.00		_ m <sub>o</sub> /	m <sub>∞</sub> = _		E	xit se	tting	= <u>A</u>	
₽t <sub>2</sub> /	/p <sub>t∞</sub> =	0.917	m <sub>bl</sub>	$/m_{\infty} =$	0.100		t <sub>2</sub> = _	0.096			p <sub>2</sub> /p <sub>∞</sub>	, = <u>6.</u>	35
RAKE			TUBE	NO.			RAKE		-	TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	24	5	6
1	0.894	0.925	0.950	0.956	0.944	0.928	2	0.876	0.899	0.920	0.946	0.964	0.927
				0.898			4	0.877	0.884	0.902	0.927	0.932	0.896
5				0.928			6	0.887	0.925	0.955	0.963	0.950	0.918
$M_{\infty} =$	2.00			2.00			$m_{\infty} = $		E	Cxit se	etting	= <u>C</u>	
											,	_	
₽t <sub>2</sub> /	$/p_{t_{\infty}} =$	0.930	) <u> </u>	l/m∞ =	0.083	<u> </u>	t <sub>2</sub> = .	0.096			p <sub>2</sub> /p <sub>o</sub>	<u> </u>	38 ———
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	14	5	6
1	0.903	0.941	0.947	0.955	0.963	0.927	2	0.903	0.947	0.950	0.951	0.957	0.928
3	*	<del></del>		0.925	7		14	0.877	0.889	0.910	0.929	0.942	0.923
5	<b></b>					0.940	6	0.907	0.947	0.953	0.961	0.966	0.922
( )	$N \cup \bullet \cup \supset \supset$	1000	/ /	7 7			1						
		1000								Exit s	etting		
M <sub>∞</sub> =	1. <b>7</b> 5		<u>α</u> =	2.00		m <sub>O</sub> /	$m_{\infty} = 1$			Exit se	,	= <u>A</u>	
M <sub>∞</sub> =	1. <b>7</b> 5		<u>α</u> =	2.00			$m_{\infty} = 1$			Exit s	,		
$M_{\infty} = \overline{p}_{t_2}$	1. <b>7</b> 5		<u>α</u> =	$\frac{2.0^{\circ}}{1/m_{\infty}} =$		m <sub>O</sub> /	/m <sub>∞</sub> =			Exit se	p <sub>Z</sub> /p <sub>c</sub>	= <u>A</u>	
M <sub>∞</sub> =	1. <b>7</b> 5		$\alpha = \frac{\alpha}{3}$	$\frac{2.0^{\circ}}{1/m_{\infty}} =$		m <sub>O</sub> /	$m_{\infty} = 1$				p <sub>Z</sub> /p <sub>c</sub>	= <u>A</u>	
$M_{\infty} = \overline{p}_{t,2}$	1.75 /s <sub>t</sub> =	0.94	α = 3mb. TUBE	$\frac{2.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO.	<b>0.</b> 096	m <sub>0</sub> /	$m_{\infty} = 0$	0.070	- I	TUBE	p <sub>2</sub> /p <sub>0</sub>	= A = 4.	50 6
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	1.75 /Ft <sub>w</sub> =	0.94 <sup>2</sup> 2 0.961	$\alpha = \frac{1}{3}  \text{mb}$ TUBE $\frac{3}{0.953}$	$\frac{2.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO.	_0.096 _5 	m <sub>0</sub> / δ Δη 6 0.959	$m_{\infty} = \frac{1}{2}$ RAKE	0.070	2	TUBE 3 0.965	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.963	$= A$ $\infty = 4.$ $5$ $0.957$	50 6 0.936
$M_{\infty} = \overline{p}_{t,2}$ RAKE	1.75 /s <sub>t</sub> = 1 0.940 0.919	2 0.961 0.929	$\alpha = \frac{\alpha}{3}$ TUBE 3 0.953 0.945	$2.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{1}$ 0.956 0.946	5 0.970 0.943	m <sub>0</sub> / δ Δη 6 0.959	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.070 1 0.930 0.926	2 0.963	TUBE 3 0.965 0.923	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.963 0.920	= <u>A</u>	6 0.936 0.904
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	1.75 /st <sub>w</sub> =  1  0.940  0.919  0.940	2 0.961 0.929 0.960	α = 3	$2.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ 0.956 0.946 0.938	5 0.970 0.943 0.947	m <sub>0</sub> / 6 6 0.959 0.925	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.070 1 0.930 0.926	2 0.963 0.928 0.958	TUBE 3 0.965 0.923 0.959	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.963 0.920	= A = 4. 5 0.957 0.917 0.963	6 0.936 0.904
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	1.75  /Ft <sub>∞</sub> =  1  0.940  0.919  0.940  1.75	0.94 2 0.961 0.929 0.960	$\alpha = \frac{\alpha}{3}$ TUBE  3  0.953  0.945  0.961 $\alpha = \frac{\alpha}{3}$	$2.0^{\circ}$ $1/m_{\infty} =$ NO.  14  0.956  0.946  0.938  2.0°	5 0.970 0.943 0.947	m <sub>0</sub> / 6 Δη 6 0.959 0.925 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.070 1 0.930 0.926 0.940	2 0.963 0.928 0.958	TUBE 3 0.965 0.923 0.959	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.963 0.920 0.964 etting	= A = 4. 5 0.957 0.963 = C	6 0.936 0.904 0.933
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	1.75  /Ft <sub>∞</sub> =  1  0.940  0.919  0.940  1.75	0.94 2 0.961 0.929 0.960	$\alpha = \frac{\alpha}{3}$ TUBE  3  0.953  0.945  0.961 $\alpha = \frac{\alpha}{3}$	$2.0^{\circ}$ $1/m_{\infty} =$ NO.  14  0.956  0.946  0.938  2.0°	5 0.970 0.943 0.947	m <sub>0</sub> / 6 6 0.959 0.925 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.070 1 0.930 0.926 0.940	2 0.963 0.928 0.958	TUBE 3 0.965 0.923 0.959	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.963 0.920 0.964 etting	= A = 4. 5 0.957 0.917 0.963	6 0.936 0.904 0.933
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	1.75  /Ft <sub>∞</sub> =  1  0.940  0.919  0.940  1.75	0.94 2 0.961 0.929 0.960	$\alpha = \frac{\alpha}{3}$ TUBE  3  0.953  0.945  0.961 $\alpha = \frac{\alpha}{3}$	$2.0^{\circ}$ $1/m_{\infty} =$ NO.  14  0.956  0.946  0.938 $2.0^{\circ}$ $1/m_{\infty} =$	5 0.970 0.943 0.947	m <sub>0</sub> / 6 Δη 6 0.959 0.925 0.922	$m_{\infty} = \frac{1}{2}$ RAKE NO. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$	0.070 1 0.930 0.926 0.940	2 0.963 0.928 0.958	TUBE 3 0.965 0.923 0.959	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.963 0.920 0.964 etting P <sub>2</sub> /P	= A = 4. 5 0.957 0.963 = C	6 0.936 0.904 0.933
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	1.75  /Ft <sub>∞</sub> =  1  0.940  0.919  0.940  1.75	0.94 2 0.961 0.929 0.960	$\alpha = \frac{\alpha}{3}$ TUBE  3  0.953  0.945  0.961 $\alpha = \frac{\alpha}{4}$ $m_b$	$2.0^{\circ}$ $1/m_{\infty} =$ NO.  14  0.956  0.946  0.938 $2.0^{\circ}$ $1/m_{\infty} =$	5 0.970 0.943 0.947	m <sub>0</sub> / 6 Δη 6 0.959 0.925 0.922	$m_{\infty} = \frac{1}{2}$	0.070 1 0.930 0.926 0.940	2 0.963 0.928 0.958	TUBE 3 0.965 0.923 0.959 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.963 0.920 0.964 etting P <sub>2</sub> /P	= A = 4. 5 0.957 0.963 = C	6 0.936 0.904 0.933
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	1.75  /Ft <sub>w</sub> =  1 0.940 0.919 0.940 1.75  /pt <sub>w</sub> =	2 0.961 0.929 0.960	$\alpha = \frac{\alpha}{3}$ TUBE  3  0.953  0.945  0.961 $\alpha = \frac{4}{3}$ TUBE  3	$2.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{1}$ 0.956  0.946  0.938 $2.0^{\circ}$ $1/m_{\infty} =$ NO.	5 0.970 0.943 0.947	m <sub>o</sub> / 6	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE	0.070 1 0.930 0.926 0.940 - 0.078	2 0.963 0.928 0.958	TUBE  3 0.965 0.923 0.959 Exit s  TUBE  3 0.960	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.963 0.920 0.964 etting P <sub>2</sub> /P NO.  4 0.961	= A	6 0.936 0.904 0.933 .41 6 0.953
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1.75  /Ft <sub>\infty</sub> =  1 0.940 0.919 0.940 1.75  /pt <sub>\infty</sub> =	0.94 2 0.961 0.929 0.960 0.949	$\alpha = \frac{\alpha}{3}$ TUBE  3  0.953  0.945  0.961 $\alpha = \frac{\alpha}{3}$ TUBE  3  0.964	$2.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{1}$ 0.956  0.946  0.938 $2.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{1}$ 0.976	0.096 5 0.970 0.943 0.947 0.07	m <sub>o</sub> / 6	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  RAKE  NO.	0.070  1 0.930 0.926 0.078  1 0.924 0.903	2 0.963 0.928 0.958 2 0.958 0.914	TUBE  3 0.965 0.923 0.959 Exit s  TUBE  3 0.960 0.925	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.963 0.920 0.964 etting P <sub>2</sub> /P NO.  4 0.961 0.934	= A 5 0.957 0.963 = C 8 = 4 0.961 0.943	6 0.936 0.904 0.933 .41 6 0.953 0.934
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	1.75  /Ft <sub>w</sub> =  1 0.940 0.919 0.940 1.75  /Pt <sub>w</sub> =  1 0.926 0.913	0.94 2 0.961 0.929 0.960 2 0.949 0.924	α = 3	$2.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{1}$ 0.956  0.946  0.938 $2.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{1}$ 0.976  0.946	0.096 5 0.970 0.943 0.947 0.07	m <sub>0</sub> / 6 Δ <sub>1</sub> 6 0.959 0.925 0.922 m <sub>0</sub> 4 Δ	m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO 2	0.070  1 0.930 0.926 0.078  1 0.924 0.903	2 0.963 0.928 0.958	TUBE  3 0.965 0.923 0.959 Exit s  TUBE  3 0.960 0.925	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.963 0.920 0.964 etting P <sub>2</sub> /P NO.  4 0.961 0.934	= A 5 0.957 0.963 = C 8 = 4 0.961 0.943	6 0.936 0.904 0.933 .41 6 0.953 0.934

TABLE II.- ENGINE-FACE PRESSURE RECOVERY DATA,  $\overline{p}_{t_2}/p_{t_\infty}$  - Continued (b) 1.50 D inlet without vortex generators

M <sub>∞</sub> =	: <u>1.55</u>		<u> </u>	2.00		m <sub>o</sub>	/m <sub>∞</sub> = .			Exit s	etting	= <u>A</u>	
$ar{p}_{\mathrm{t}z}$	$p_{t_{\infty}} =$	0.96	8 m <sub>b</sub>	1/m <sub>∞</sub> =	0.10	<u>δ</u> Δ	p <sub>t2</sub> = .	0.056			p <sub>2</sub> /p	<sub>∞</sub> = <u>3</u> .	• 55
RAKE			TUBE	NO.			RAKE		•	TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	24	5	6
1	0.981	0.996	0.985	0.972	0.964	0.958	2	0.985	0.993	0.969	0.959	0.961	0.958
3	0.970	0.965	0.960	0.962	0.963	0.965					<del></del>	0.965	<del></del>
5	0.987	0.960	0.958	0.942	0.962	0.965						0.961	+
$M_{\infty} =$	1.55		_ α =	2.00		m <sub>o</sub>							
$ar{p}_{ exttt{tz}}$	$/p_{t_{\infty}} =$	0.966	<u>5                                    </u>	$_{ m l}/{ m m}_{\infty}$ =	0.07	<b>7</b> △:	0t2 =	0.054			p <sub>o</sub> /p		. 45
			TUBE										
RAKE NO.	1	2		4	5	6	RAKE NO.	1	2	TUBE	4		6
1	<del> </del>		<del></del>	0.963								0.960	<del></del>
3	0.964						<del></del>					0.965	+
	0.984		† <del></del>			<del></del>						0.960	
-	3.00					•							0.777
												- <u>A</u>	
P <sub>tz</sub>	$/p_{t_{\infty}} =$	0.806	( m	/m _		\ \ \ \ \							
		0.000	p.	1/111∞ =	0.099		o <sub>t2</sub> = _	0.222			. p <sub>2</sub> /p <sub>0</sub>	<sub>∞</sub> = <u>28</u>	3.02
RAKE		0.000	TUBE		0.099		,	0.222				∞ = <u>2</u> 8	3.02
RAKE NO.	1	2	TUBE		5		RAKE	1		TUBE	NO.	∞ = <u>28</u>	
1		2	TUBE	NO.	5	6	RAKE NO.	1	2	TUBE	NO.		6
NO.	0.777	2	TUBE 3 0.850	NO.	5 0.888	6 0.809	RAKE NO.	1 0•759	2 0•794	TUBE 3 0.834	NO. 4	5	6 0.818
NO.	0.777	2 0.812 0.808	TUBE 3 0.850 0.823	NO. 4 0.881 0.795	5 0.888 0.765	6 0.809 0.739	RAKE NO. 2	1 0•759 0•768	2 0.794 0.785	TUBE 3 0.834 0.789	NO. 4 0.886 0.761	5 0.893 0.736	6 0.818 0.724
NO.  1 3 5	0.777 0.776	2 0.812 0.808 0.825	TUBE  3 0.850 0.823 0.811	NO. 4 0.881 0.795	5 0.888 0.765 0.757	6 0.809 0.739 0.735	RAKE NO. 2 4	1 0•759 0•768 0•762	2 0.794 0.785 0.806	TUBE 3 0.834 0.789	NO. 4 0.886 0.761 0.903	5 0.893 0.736 0.896	6 0.818 0.724
NO. $\frac{1}{3}$ $5$ $M_{\infty} =$	0.777 0.776 0.782	2 0.812 0.808 0.825	TUBE 3 0.850 0.823 0.811 α =	NO.  14  0.881  0.795  0.785  5.00	5 0.888 0.765 0.757	6 0.809 0.739 0.735 m <sub>o</sub> /	RAKE NO. 2 4 6	1 0.759 0.768 0.762	2 0.794 0.785 0.806	TUBE 3 0.834 0.789 0.859	NO. 4 0.886 0.761 0.903	5 0.893 0.736 0.896	6 0.818 0.724 0.809
NO.  1 3 5 $M_{\infty} = \bar{p}_{t,2}$ RAKE	0.777 0.776 0.782 3.00	2 0.812 0.808 0.825	TUBE 3 0.850 0.823 0.811 α =	NO.  14  0.881  0.795  0.785  5.00  /m <sub>∞</sub> =	5 0.888 0.765 0.757	6 0.809 0.739 0.735 m <sub>o</sub> /	RAKE NO. 2 4 6	1 0.759 0.768 0.762	2 0.794 0.785 0.806	TUBE 3 0.834 0.789 0.859	NO. 4 0.886 0.761 0.903 etting P <sub>2</sub> /P <sub>0</sub>	5 0.893 0.736 0.896 = C	6 0.818 0.724 0.809
NO. $ \begin{array}{c} 1 \\ 3 \\ 5 \end{array} $ $ M_{\infty} = \overline{p}_{t,2} $	0.777 0.776 0.782 3.00	2 0.812 0.808 0.825	TUBE  3 0.850 0.823 0.811 $\alpha = \frac{m}{b}$	NO.  14  0.881  0.795  0.785  5.00  /m <sub>∞</sub> =	5 0.888 0.765 0.757	6 0.809 0.739 0.735 m <sub>o</sub> /	RAKE NO. 2 4 6 $m_{\infty} =$	1 0.759 0.768 0.762	2 0.794 0.785 0.806	TUBE 3 0.834 0.789 0.859 Exit se	NO. 4 0.886 0.761 0.903 etting P <sub>2</sub> /P <sub>0</sub>	5 0.893 0.736 0.896 = C	6 0.818 0.724 0.809
NO.  1 3 5 $M_{\infty} = \bar{p}_{t,2}$ RAKE	0.777 0.776 0.782 3.00 /p <sub>t</sub> =	2 0.812 0.808 0.825	TUBE  3 0.850 0.823 0.811  \[ \alpha =  \text{mb1} \]  TUBE  3	NO. $^{14}$ 0.881 0.795 0.785 $^{5.00}$ $^{/m_{\infty}} =$ NO.	5 0.888 0.765 0.757 0.078	6 0.809 0.739 0.735	RAKE NO. 2 4 6 /m_o =	1 0.759 0.768 0.762 0.241	2 0.794 0.785 0.806	TUBE 3 0.834 0.789 0.859 Exit se	NO.  4  0.886  0.761  0.903  etting  P <sub>2</sub> /P <sub>0</sub> NO.  4	5 0.893 0.736 0.896 = C = C	6 0.818 0.724 0.809
NO.  1 3 5 $M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	0.777 0.776 0.782 3.00 /p <sub>t</sub> =	2 0.812 0.808 0.825 0.792	TUBE  3 0.850 0.823 0.811  \[ \alpha = \frac{m}{5} \]  TUBE  3 0.858	NO.  14  0.881  0.795  0.785  5.00  /m_  =  NO.  4	5 0.888 0.765 0.757 0.078	6 0.809 0.739 0.735 m <sub>o</sub> Δ1 6 0.789	RAKE NO.  2 4 6 /m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO. 2	1 0.759 0.768 0.762 	2 0.794 0.785 0.806	TUBE  3 0.834 0.789 0.859 Exit se	NO.  4  0.886  0.761  0.903  etting  p <sub>2</sub> /p <sub>0</sub> NO.  4  0.896	5 0.893 0.736 0.896 = C	6 0.818 0.724 0.809

M <sub>∞</sub> =	2 <b>.7</b> 5		_ α =	5.0°		_ m <sub>o</sub> /	m <sub>∞</sub> = _		E	xit se	tting	= <u>A</u>	
${f ar p}_{{ m t}_2}$	′p <sub>t∞</sub> =	0.810	<sup>m</sup> bl	$/m_{\infty} =$	0.094	^p	t <sub>2</sub> = _	0.201			p <sub>2</sub> /p <sub>∞</sub>	= 18	.81
RAKE TUBE NO.								RAKE TUBE NO.					
NO.	1	2	3	4	5	6	NO.	1	2	.3	14	5	6
1	0.801	0.835	0.860	0.873	0.848	0.790	2	0.775	0.814	0.852	0.868	0.892	0.842
3					0 <b>.7</b> 56			0.804	0.817	0.787	0.763	0.745	0.730
5	0.810	0.825	0.803	0.775	0.755	0.738	6	0.775	0.821	0.855	0.868	0.889	0.833
M <sub>∞</sub> =	2.75		_ α =	5.0°		_ m <sub>o</sub> /	'm <sub>∞</sub> = _		F	Exit se	etting	= <u>C</u>	
₽t2	/p <sub>t</sub> =	0.808	3 <u> </u>	$/m_{\infty} =$	0.087	^r	)t2 = .	0.267			p <sub>2</sub> /p <sub>0</sub>	, = <u>18</u>	.64
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	14	5	6	NO.	1	2	3	4	5	6
1	0.824	0.859	0.874	0.848	0.839	0.789	2	0.778	0.809	0.842	0.889	0.917	0.813
3	*				0.850			0.701	0.723	0.752	0.790	0.824	0.791
5								0.769	0.806	0.851	0.898	0.908	0.812
		,											
											etting		
M <sub>∞</sub> =	2.50		<u>α</u> =	5.0°		m <sub>O</sub> ,	$m_{\infty} = 1$				etting		
$M_{\infty} = \bar{p}_{t_2}$	2.50		α =  0 mb	$\frac{5.0^{\circ}}{1/m_{\infty}} =$		m <sub>O</sub> ,	/m <sub>∞</sub> = p <sub>t2</sub> =				etting _ p <sub>2</sub> /p <sub>0</sub>	= <u>A</u>	
M <sub>∞</sub> =	2.50		<u>α</u> =	$\frac{5.0^{\circ}}{1/m_{\infty}} =$		m <sub>O</sub> ,	$m_{\infty} = 1$			Exit s	etting _ p <sub>2</sub> /p <sub>0</sub>	= <u>A</u>	
$M_{\infty} = \bar{p}_{t_2}$	2.50 /p <sub>t</sub> =	0.81	α =  5 <sup>m</sup> b  TUBE	$\frac{5.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO.	0.091	m <sub>0</sub> ,	$m_{\infty} = 0$	0.221	2	TUBE	etting P <sub>2</sub> /P <sub>0</sub> NO.	= A = 12	6
$M_{\infty} = \bar{P}_{t_2}$ RAKE	2.50 /p <sub>t</sub> <sub>∞</sub> =	0.81 <sup>9</sup>	$\alpha = \frac{\alpha}{2}  \text{mb}$ TUBE $\frac{3}{0.880}$	$5.0^{\circ}$ $1/m_{\infty} =$ NO. 4 0.895	0.091	m <sub>o</sub> , Δ: 6 0.847	$m_{\infty} = 0$ $m_{\infty$	0.221	2	TUBE  3 0.855	P <sub>2</sub> /P <sub>0</sub>	= A = 12 5 0.886	6 0.834
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	2.50 /Pt <sub>w</sub> = 1 0.829 0.757	0.81 2 0.854 0.757	$\alpha = \frac{1}{2}  \text{mb}$ TUBE  3 0.880 0.774	$5.0^{\circ}$ $1/m_{\infty} =$ NO. 4 0.895 0.791	5 0.898 0.793	m <sub>o</sub> ,   Δ:  6  0.847  0.781	$m_{\infty} = 0$ $m_{\infty$	0.221	2 0.836 0.748	TUBE 3 0.855	p <sub>2</sub> /p <sub>0</sub> NO. 4 0.874	= A = 12 5 0.886 0.787	6 0.834 0.773
$M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$ RAKE NO.	2.50 /Pt <sub>w</sub> = 1 0.829 0.757	0.81 <sup>9</sup> 2 0.85 <sup>4</sup> 0.757 0.759	$\alpha = \frac{1}{2}  \text{mb}$ TUBE  3 0.880 0.774	$5.0^{\circ}$ $1/m_{\infty} =$ $1/m_{\infty$	5 0.898 0.793 0.800	6 0.847 0.781 0.788	m <sub>∞</sub> = Pt <sub>2</sub> = RAKE NO. 2 4	0.221 1 0.805 0.738 0.800	2 0.836 0.748 0.824	TUBE 3 0.855 0.763 0.852	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.874 0.776	= A = 12 5 0.886 0.787 0.919	6 0.834 0.773
$M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$ RAKE NO.  1  3  5 $M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$	2.50  /Pt <sub>w</sub> =  1  0.829  0.757  0.753  2.50	0.819 2 0.854 0.757 0.759	α =  5	$5.0^{\circ}$ $1/m_{\infty} = $ $1/m_{\infty$	5 0.898 0.793 0.800	6 0.847 0.781 0.788	$m_{\infty} = m_{0}$ $m_{\infty} = m_{0}$ $m_{0} = m_{0}$ $m_{0} = m_{0}$ $m_{0} = m_{0}$	0.221 1 0.805 0.738 0.800	2 0.836 0.748 0.824	TUBE 3 0.855 0.763 0.852	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.874 0.776 0.890 etting	= A = 12 5 0.886 0.787 0.919	6 0.834 0.773 0.850
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$	2.50  /Pt <sub>w</sub> =  1  0.829  0.757  0.753  2.50	0.819 2 0.854 0.757 0.759	α =  5	$5.0^{\circ}$ $1/m_{\infty} = $ NO. $4$ 0.895  0.791  0.788 $5.0^{\circ}$ $1/m_{\infty} = $	5 0.898 0.793 0.800	6 0.847 0.781 0.788	$m_{\infty} = m_{0}$ $m_{\infty} = m_{0}$ $m_{0} = m_{0}$ $m_{0} = m_{0}$ $m_{0} = m_{0}$	0.221 1 0.805 0.738 0.800	2 0.836 0.748 0.824	TUBE 3 0.855 0.763 0.852	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.874 0.776 0.890 etting	= A 5 0.886 0.787 0.919 = C	6 0.834 0.773 0.850
$M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$ RAKE NO.  1  3  5 $M_{\infty} = \frac{\bar{p}_{t_2}}{\bar{p}_{t_2}}$	2.50  /Pt <sub>w</sub> =  1  0.829  0.757  0.753  2.50	0.819 2 0.854 0.757 0.759	$\alpha = \frac{\alpha}{5}$ TUBE  3  0.880  0.774  0.775 $\alpha = \frac{\alpha}{5}$	$5.0^{\circ}$ $1/m_{\infty} = $ NO. $4$ 0.895  0.791  0.788 $5.0^{\circ}$ $1/m_{\infty} = $	5 0.898 0.793 0.800	6 0.847 0.781 0.788	$m_{\infty} = m_{t_2} = m_{t_2$	0.221 1 0.805 0.738 0.800	2 0.836 0.748 0.824	TUBE 3 0.855 0.763 0.852 Exit s	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.874 0.776 0.890 etting	= A 5 0.886 0.787 0.919 = C	6 0.834 0.773 0.850
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE	2.50 $/p_{t_{\infty}} =$ 1 0.829 0.757 0.753 $= 2.50$ $e^{/p_{t_{\infty}}} =$ 1	2 0.854 0.757 0.759	$\alpha = \frac{\alpha}{5}$ TUBE  3  0.880  0.774  0.775 $\alpha = \frac{\alpha}{5}$ TUBE	$5.0^{\circ}$ $1/m_{\infty} =$ NO.  4  0.895  0.791  0.788 $5.0^{\circ}$ $1/m_{\infty} =$ NO.  4	5 0.898 0.793 0.800	6 0.847 0.781 0.788 m <sub>o</sub>	$m_{\infty} = \frac{1}{2}$ RAKE NO. $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ RAKE NO.	0.221 1 0.805 0.738 0.800 	2 0.836 0.748 0.824 2 0.817	TUBE 3 0.855 0.763 0.852 Exit s	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.874 0.776 0.890 etting P <sub>2</sub> /P	= A = 12 5 0.886 0.787 0.919 = C = 12 5 0.915	6 0.834 0.773 0.850 2.80 6 0.858
$M_{\infty} = \overline{p}_{t_2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{p}_{t_2}$ RAKE NO.	2.50 /Pt <sub>w</sub> = 1 0.829 0.757 0.753 = 2.50 2/Pt <sub>w</sub> = 1 0.832	0.819 2 0.854 0.757 0.759 0.82	α =  7 mb  TUBE  3 0.880 0.774 0.775 α = 0 mb  TUBE  3 0.888	$5.0^{\circ}$ $1/m_{\infty} =$ $1/m_{\infty} =$ $0.895$ $0.791$ $0.788$ $5.0^{\circ}$ $1/m_{\infty} =$ $1/m_{\infty} =$ $1/m_{\infty} =$	5 0.898 0.793 0.800	6 0.847 0.781 0.788  mo 3 6 0.836	$m_{\infty} = 0$ $m_{\infty$	0.221  1 0.805 0.738 0.800  0.268  1 0.799 0.716	2 0.836 0.748 0.824 2 0.817 0.732	TUBE 3 0.855 0.763 0.852 Exit s TUBE 3 0.844 0.760	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.874 0.776 0.890 etting  p <sub>2</sub> /p NO.  4 0.882 0.793	= A 5 0.886 0.787 0.919 = C 5 0.915 0.806	6 0.834 0.773 0.850 2.80 6 0.858 0.785
$M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t_2}$ RAKE  NO.  1	2.50  /Pt <sub>w</sub> =  1 0.829 0.757 0.753  2.50  /Pt <sub>w</sub> =  1 0.832 0.727	0.819 2 0.854 0.757 0.759  0.82	α =  TUBE  3  0.880  0.774  0.775  α =  0 mb  TUBE  3  0.888	$5.0^{\circ}$ $1/m_{\infty} =$ NO. $4$ 0.895  0.791  0.788 $5.0^{\circ}$ $1/m_{\infty} =$ NO. $4$ 0.888  0.799	5 0.898 0.793 0.800 0.08	6 0.847 0.788 0.788  mo 3 6 0.836 0.828	m <sub>∞</sub> =  Pt <sub>2</sub> =  RAKE NO.  2  4  6  /m <sub>∞</sub> =  Pt <sub>2</sub> =  RAKE NO.  2  4  4	0.221  1 0.805 0.738 0.800  0.268  1 0.799 0.716	2 0.836 0.748 0.824 2 0.817 0.732	TUBE 3 0.855 0.763 0.852 Exit s TUBE 3 0.844 0.760	p <sub>2</sub> /p <sub>0</sub> NO.  4 0.874 0.776 0.890 etting  p <sub>2</sub> /p NO.  4 0.882 0.793	= A 5 0.886 0.787 0.919 = C 5 0.915 0.806	6 0.834 0.773 0.850 2.80 6 0.858

 $M_{\infty} = 2.25$   $\alpha = 5.0^{\circ}$   $m_{\circ}/m_{\infty} =$  Exit setting = A  $\bar{p}_{t_2}/p_{t_\infty} = 0.874$   $m_{b1}/m_{e} = 0.126$   $\Delta p_{t_2} = 0.155$   $p_2/p_{\infty} = 9.10$ TUBE NO. RAKE TUBE NO. RAKE NO. NO. 1 2 5 3 1 0.895 | 0.912 | 0.924 | 0.920 | 0.919 | 0.888 | 2 | 0.886 | 0.896 | 0.898 | 0.906 | 0.923 | 0.905 0.827 | 0.828 | 0.834 | 0.837 | 0.843 | 0.838 | 4 | 0.817 | 0.819 | 0.830 | 0.841 | 0.845 | 0.839 0.837 0.841 0.844 0.832 0.857 0.850 6 | 0.871 | 0.901 | 0.924 | 0.953 | 0.950 | 0.922  $M_{\infty} = 2.25 \qquad \alpha = 5.0^{\circ}$  $m_{O}/m_{\infty} =$  Exit setting = C  $\bar{p}_{t_2}/p_{t_\infty} = 0.864 \quad m_{b_1}/m_{\infty} = 0.084 \quad \Delta p_{t_2} = 0.211 \quad p_2/p_{\infty} = 8.73$ TUBE NO. TUBE NO. RAKE RAKE NO. NO. 1 2 1 2 3 5 6 0.890 0.904 0.904 0.923 0.909 0.845 2 | 0.876 | 0.886 | 0.895 | 0.917 | 0.942 | 0.896 0.793 | 0.803 | 0.819 | 0.837 | 0.863 | 0.858 | 4 | 0.776 | 0.787 | 0.799 | 0.817 | 0.830 | 0.827 0.814 0.814 0.826 0.825 0.871 0.873 6 ||0.873|0.896|0.923|0.959|0.941|0.901  $M_{\infty} = 2.00$   $\alpha = 5.0^{\circ}$   $m_{\circ}/m_{\infty} =$  Exit setting = A  $\bar{p}_{t_2}/p_{t_{\infty}} = 0.869$   $m_{b_1}/m_{\infty} = 0.090$   $\Delta p_{t_2} = 0.177$   $p_2/p_{\infty} = 5.88$ TUBE NO. RAKE RAKE TUBE NO. NO. NO. 6 5 1 2 0.888 0.933 0.948 0.945 0.922 0.907 2 ||0.861|0.877|0.889|0.921|0.938|0.877 0.824 | 0.825 | 0.817 | 0.812 | 0.807 | 0.795 | 4 | | 0.825 | 0.826 | 0.838 | 0.844 | 0.836 | 0.811 0.852 0.848 0.836 0.807 0.808 0.794 6 10.897 0.926 0.939 0.945 0.946 0.912  $M_{\infty} = 2.00$   $\alpha = 5.0^{\circ}$   $m_{\circ}/m_{\infty} =$  Exit setting = C  $\bar{p}_{t_2}/p_{t_\infty} = 0.850 \quad m_{b1}/m_\infty = 0.075 \quad \Delta p_{t_2} = 0.204 \quad p_2/p_\infty = 5.75$ TUBE NO. RAKE TUBE NO. RAKE NO. 5 NO. 3 6 1 2 3 6 0.834 0.859 0.884 0.898 0.888 0.860 0.850 | 0.860 | 0.824 | 0.804 | 0.797 | 0.783 2 0.838 0.856 0.870 0.882 0.902 0.912 0.822 | 0.824 | 0.820 | 0.816 | 0.820 | 0.809 3 4 0.855 0.877 0.897 0.890 0.935 0.903 5 0.849 | 0.873 | 0.833 | 0.806 | 0.799 | 0.761

M <sub>∞</sub> =	1.75		_ α =	5.0°		_ m <sub>o</sub> /	, m <sub>∞</sub> = _		F	Exit se	etting	= <u>A</u>	
<b>p</b> t <sub>2</sub> /	′p <sub>t∞</sub> =	0.931	L <sup>m</sup> bl	/m <sub>∞</sub> =	0.103	Δr	t2 = .	0.092			p <sub>2</sub> /p <sub>o</sub>	o = 14.	47
RAKE			TUBE	NO.			RAKE			TUBE	NO.		
NO.	1	2	3	<u>1</u> 4	5	6	NO.	1	2	3	),	5	6
1	0.957	0.977	0.975	0.971	0.949	0.918	2	0.943	0.910	0.899	0.900	0.900	0.892
3			0.956					0.911	0.917	0.917	0.918	0.915	0.904
5			0.963				1 1	0.925	0.902	0.905	0.906	0.907	0.898
M <sub>∞</sub> =	1.75		<u>α</u> =	5.0°		m <sub>o</sub> /	′m <sub>∞</sub> = _		I	Exit se	etting	= <u>C</u>	
= .					0.07/	· Λτ	_	0.101			n /n	_ ),	مارد
Pt <sub>2</sub> /	pt <sub>∞</sub> =	0.92	7m <sub>b</sub> ]	[/III∞ =	0.070	)	't2	0.101			. p <sub>2</sub> /p <sub>c</sub>	o <u> </u>	<del></del>
RAKE			TUBE	NO.	<del></del>		RAKE			TUBE	NO.		
NO.	1	2	3	4	5	6	NO.	1	2	3	4	5	6
1	0.951	0.973	0.975	0.971	0.951	0.906	2	0.942	0.910	0.900	0.900	0.900	0.890
3	0.911	0.941	0.960	0.966	0.968	0.954	4	0.881	0.889	0.893	0.897	0.904	0.895
5	0.914	0.945	0.958	0.948	0.971	0.957	6	0.933	0.902	0.904	0.906	0.907	0.887
			_ α =			•						-	
$M_{\infty} =$	1.55			5.0°		m <sub>o</sub> ,	/m <sub>∞</sub> = .			Exit s	etting	= <u>A</u>	
$M_{\infty} = \overline{p}_{t,2}$	1.55		$\alpha = \frac{1}{mb}$	5.0° 1/m <sub>∞</sub> =		m <sub>o</sub> ,	/m <sub>∞</sub> = .			Exit s	etting _ p <sub>2</sub> /p	= <u>A</u>	
$M_{\infty} =$	1.55		α =	5.0° 1/m <sub>∞</sub> =		m <sub>o</sub> ,	/m <sub>∞</sub> = .			Exit s	etting _ p <sub>2</sub> /p	= <u>A</u>	
$M_{\infty} = \overline{p}_{t,2}$ RAKE	1.55 /p <sub>t<sub>∞</sub></sub> =	0.95	$\alpha = \frac{1}{1} m_{b}$	$\frac{5.0^{\circ}}{1/m_{\infty}} = \frac{1}{1/m_{\infty}}$ NO.	0.096	m <sub>o</sub> ,	$m_{\infty} = 0$	0.085	2	Exit s TUBE	etting p <sub>2</sub> /p <sub>0</sub> NO.	$= A$ $\infty = 3$	6
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.	1.55 /p <sub>t<sub>∞</sub></sub> =	0.95 2 0.994	$\alpha = \frac{1}{1} mb$ TUBE $\frac{3}{0.982}$	$5.0^{\circ}$ $1/m_{\infty} = $ NO. $\frac{1}{4}$ 0.965	0.096 5 0.951	m <sub>0</sub> , 6 Δ <sub>1</sub> 6 0.948	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.085	2	TUBE 3 0.947	p <sub>2</sub> /p <sub>0</sub>	= A = 3.0 5 0.951	6 0.947
$M_{\infty} = \overline{p}_{t,2}$ RAKE	1.55 /p <sub>t<sub>∞</sub></sub> = 1 0.982 0.936	0.95. 2 0.994 0.953	$\alpha = \frac{1}{1} m_{b}$	$5.0^{\circ}$ $1/m_{\infty} =$ NO. $1_{4}$ 0.965 0.963	0.096 5 0.951 0.963	m <sub>0</sub> , 6 Δ] 6 0.948 0.954	$m_{\infty} = \frac{1}{2}$ RAKE NO.	0.085 1 0.950 0.913	2 0.942 0.918	TUBE 3 0.947 0.923	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.950	= A = 3. 5 0.951 0.930	6 0.947 0.925
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3	1.55 /pt <sub>w</sub> = 1 0.982 0.936 0.934	0.95. 2 0.994 0.953 0.949	$\alpha = \frac{1}{1000}$ TUBE 3 0.982 0.961 0.969	$5.0^{\circ}$ $1/m_{\infty} =$ NO. $1/m_{\infty} =$ 0.965  0.963  0.957	0.096 5 0.951 0.963 0.976	6 0.948 0.954 0.970	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2	0.085 1 0.950 0.913 0.943	2 0.942 0.918 0.945	TUBE 3 0.947 0.923 0.950	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.950 0.925 0.952	= A = 3. 5 0.951 0.930 0.955	6 0.947 0.925
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3 $M_{\infty} = \overline{p}_{t,2}$	1.55 /p <sub>t</sub> = 1 0.982 0.936 0.934 1.55	0.95 2 0.994 0.953 0.949	$\alpha = \frac{1}{1} m_{b}$ TUBE  3  0.982  0.961	5.0° 1/m∞ = NO.  1/m 0.965 0.963 0.957 5.0°	0.096 5 0.951 0.963 0.976	6 0.948 0.954 0.970	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.085 1 0.950 0.913 0.943	2 0.942 0.918 0.945	TUBE 3 0.947 0.923 0.950	P <sub>2</sub> /P <sub>0</sub> NO. 4 0.950 0.925 0.952 etting	= A = 3. 5 0.951 0.930 0.955	6 0.947 0.925 0.951
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$	1.55 /p <sub>t<sub>∞</sub></sub> =  1 0.982 0.936 0.934 1.55	0.95 2 0.994 0.953 0.949	$\alpha = \frac{1}{1} m_{b}$ TUBE  3  0.982  0.961  0.969 $\alpha = \frac{1}{1} m_{b}$	$5.0^{\circ}$ $1/m_{\infty} =$ NO. $4$ 0.965  0.963  0.957 $5.0^{\circ}$ $1/m_{\infty} =$	0.096 5 0.951 0.963 0.976	6 0.948 0.954 0.970	$m_{\infty} = \frac{1}{2}$ RAKE NO. 2 4 6 $m_{\infty} = \frac{1}{2}$	0.085 1 0.950 0.913 0.943	2 0.942 0.918 0.945	TUBE 3 0.947 0.923 0.950	etting $p_{2}/p_{0}$ NO. $4$ 0.950 0.925 0.952 etting $p_{2}/p_{0}$	= A = 3. 5 0.951 0.955 = C	6 0.947 0.925 0.951
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3 $M_{\infty} = \overline{p}_{t,2}$	1.55 /p <sub>t<sub>∞</sub></sub> =  1 0.982 0.936 0.934 1.55	0.95 2 0.994 0.953 0.949	$\alpha = \frac{1}{1} m_{b}$ TUBE  3 0.982 0.961 0.969 $\alpha = \frac{8}{1} m_{b}$	$5.0^{\circ}$ $1/m_{\infty} =$ NO. $4$ 0.965  0.963  0.957 $5.0^{\circ}$ $1/m_{\infty} =$	0.096 5 0.951 0.963 0.976	6 0.948 0.954 0.970	$m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$ $m_{\infty} = \frac{1}{2}$	0.085 1 0.950 0.913 0.943	2 0.942 0.918 0.945	TUBE 3 0.947 0.923 0.950 Exit s	etting $p_{2}/p_{0}$ NO. $4$ 0.950 0.925 0.952 etting $p_{2}/p_{0}$	= A = 3. 5 0.951 0.955 = C	6 0.947 0.925 0.951
$M_{\infty} = \overline{p}_{t,2}$ RAKE  NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$ RAKE	1.55 /p <sub>t<sub>∞</sub></sub> =  1 0.982 0.936 0.934  1.55  /p <sub>t<sub>∞</sub></sub> =	0.95 2 0.994 0.953 0.949	$\alpha = \frac{1}{1} - \frac{m_b}{1}$ TUBE  3  0.982  0.961  0.969 $\alpha = \frac{8}{1} - \frac{m_b}{1}$ TUBE	$5.0^{\circ}$ $1/m_{\infty} = $	5 0.951 0.963 0.976	6 0.948 0.954 0.970 m <sub>o</sub>	$m_{\infty} = \frac{1}{2}$	0.085 1 0.950 0.913 0.943 0.098	2 0.942 0.918 0.945	TUBE  3 0.947 0.923 0.950 Exit s	etting $p_{2}/p_{0}$ $NO.$ $4$ $0.950$ $0.925$ $0.952$ etting $p_{2}/p$ $NO.$ $14$	= A = 3. 5 0.951 0.955 = C = 3	6 0.947 0.925 0.951
$M_{\infty} = \overline{P}_{t,2}$ RAKE NO.  1 3 5 $M_{\infty} = \overline{P}_{t,2}$ RAKE NO.	1.55 /pt <sub>w</sub> =  1 0.982 0.936 0.934 1.55  /pt <sub>w</sub> =	0.95 2 0.994 0.953 0.949 0.94	$\alpha = \frac{1}{1} m_b$ TUBE  3  0.982  0.961  0.969 $\alpha = \frac{1}{1} m_b$ TUBE	$5.0^{\circ}$ $1/m_{\infty} =$ NO. $\frac{1}{4}$ 0.965 0.963 0.957 $\frac{1}{m_{\infty}} =$ NO. $\frac{1}{4}$ 0.957	0.096 5 0.951 0.963 0.976 0.07	6 0.948 0.954 0.970 mo	$m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  4  6 $m_{\infty} = \frac{1}{2}$ RAKE  NO.  2  RAKE  NO.  2	0.085 1 0.950 0.913 0.943 0.098	2 0.942 0.918 0.945	TUBE 3 0.947 0.923 0.950 Exit s TUBE 3 0.948	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.950 0.925 0.952 etting P <sub>2</sub> /P NO.  4 0.951	= A	6 0.947 0.925 0.951
$M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1  3  5 $M_{\infty} = \overline{p}_{t,2}$ RAKE NO.  1	1.55 /Pt <sub>w</sub> =  1 0.982 0.934  1.55  /Pt <sub>w</sub> =  1 0.977 0.933	0.95 2 0.994 0.953 0.949 2 0.994 0.953	α =  1	5.0°  1/m <sub>∞</sub> =  NO.  14  0.965  0.963  0.957  5.0°  1/m <sub>∞</sub> =  NO.  14  0.957  0.962	0.096 5 0.951 0.963 0.976 0.07	m <sub>o</sub> , 6 Δ <sub>1</sub> 6 0.948 0.970 — m <sub>o</sub> 1 Δ 6 0.946 0.948	/m <sub>\infty</sub> =   Pt <sub>2</sub> =   RAKE   NO.     Pt <sub>2</sub> =   RAKE   NO.     Pt <sub>2</sub> =   RAKE   NO.     Pt <sub>2</sub> =   Pt <sub>2</sub>	0.085 1 0.950 0.913 0.943 0.098 1 0.958 0.901	2 0.942 0.918 0.945 - 2 0.943 0.907	TUBE 3 0.947 0.923 0.950 Exit s TUBE 3 0.948 0.908	P <sub>2</sub> /P <sub>0</sub> NO.  4 0.950 0.925 0.952 etting P <sub>2</sub> /P NO.  4 0.951 0.912	= A = 3. 5 0.951 0.955 = C = 3 5 0.950 0.917	6 0.947 0.925 0.951 .31 6 0.947

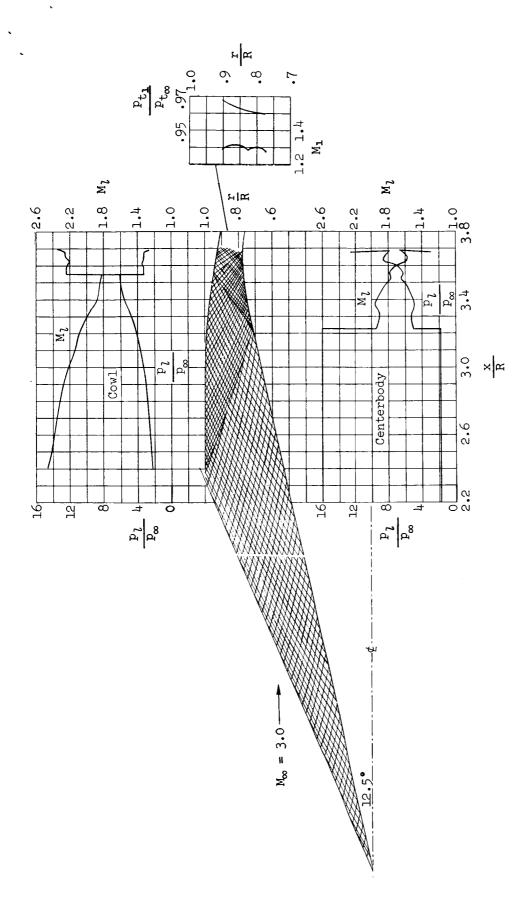
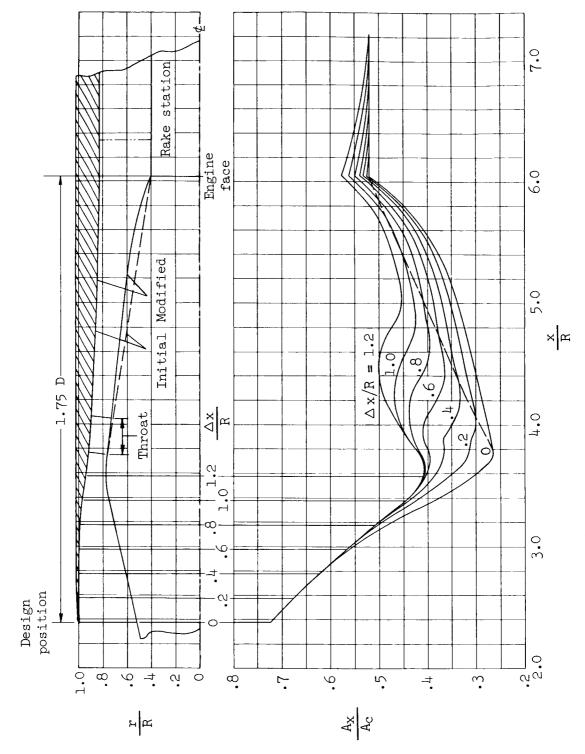


Figure 1.- Design theoretical supersonic flow field.



(a) Initial and modified 1.75 diameter inlets.

Figure 2.- Area distributions.

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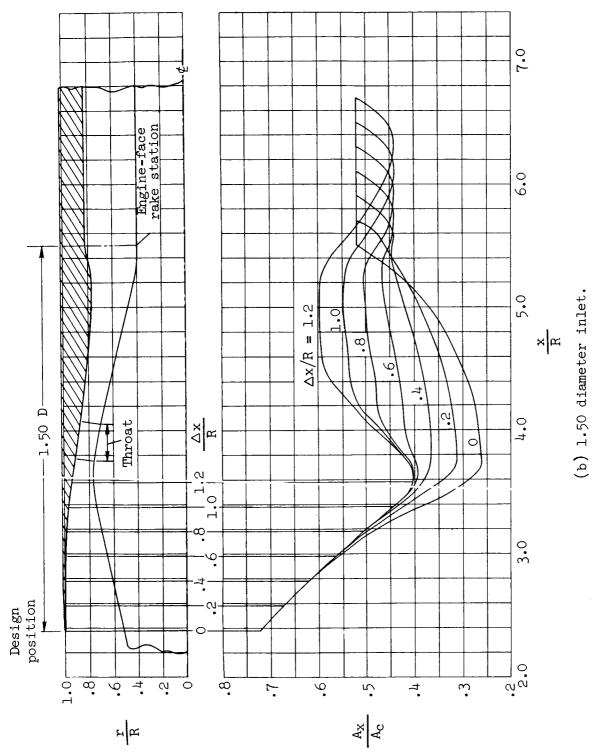


Figure 2.- Concluded.

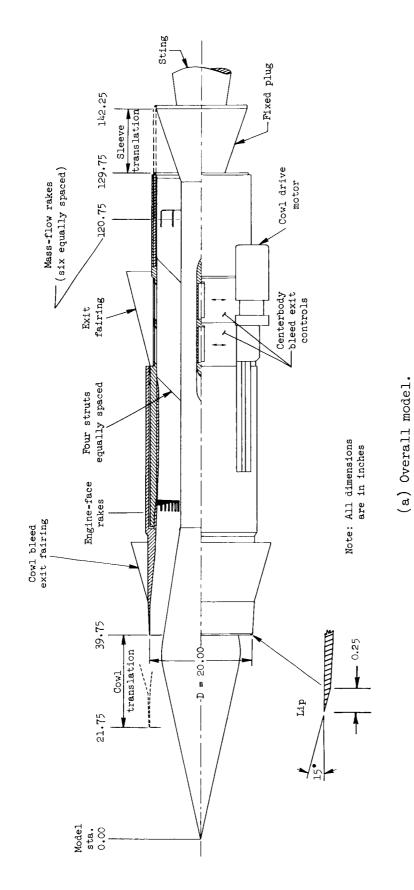
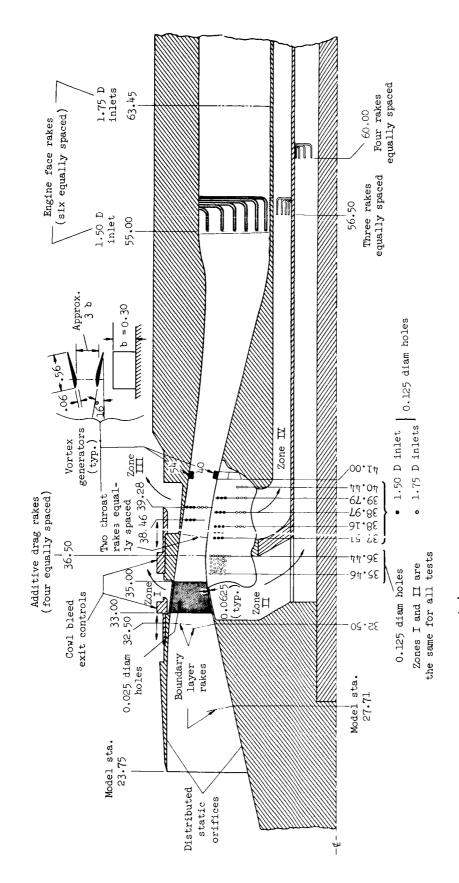


Figure 3.- Model.

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(b) Bleed configurations and instrumentation.

Figure 3.- Concluded.

Figure  $\mu$  .- Model mounted in the transonic wind tunnel.

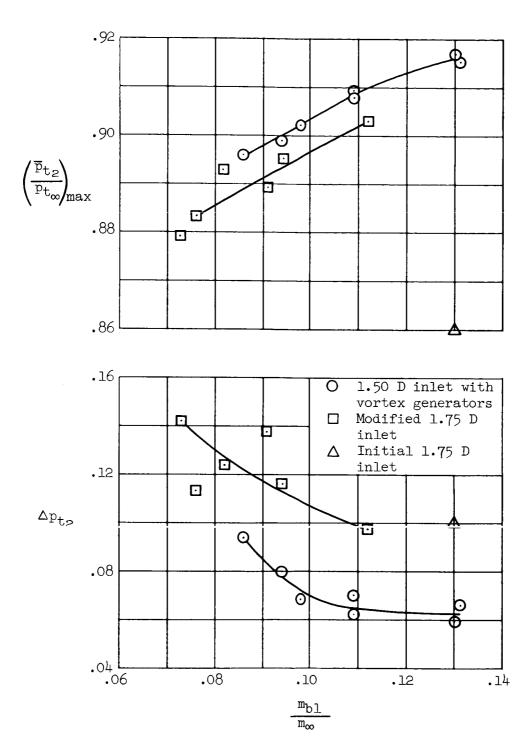


Figure 5.- Maximum performance,  $M_{\infty}$  = 3.00,  $\alpha$  = 0°.

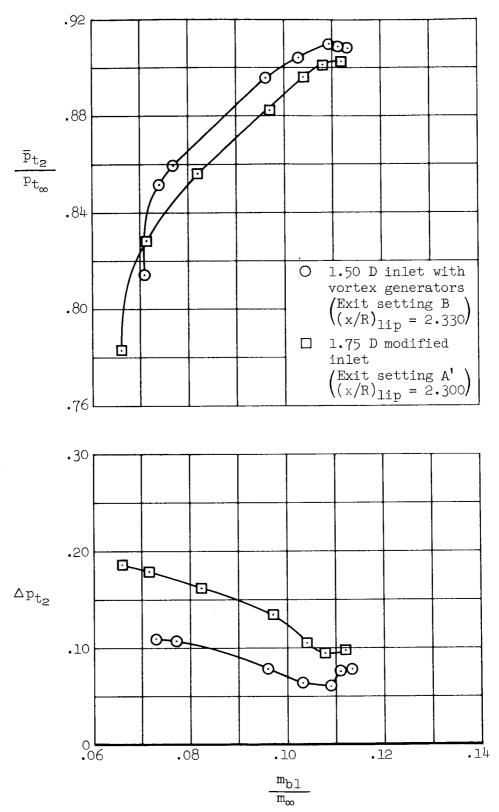


Figure 6.- Supercritical performance;  $\rm M_{\infty}$  = 3.00,  $\alpha$  = 0°.

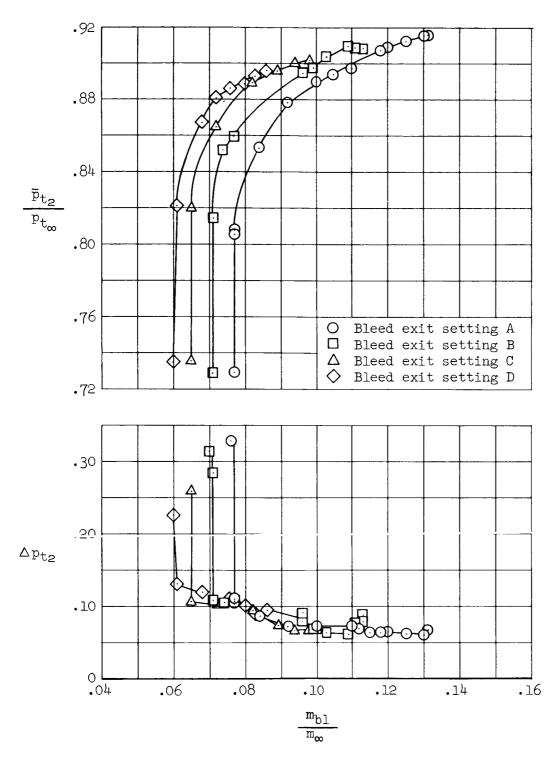


Figure 7.- Supercritical performance, 1.50 D inlet with vortex generators;  $(x/R)_{\text{lip}}$  = 2.330;  $M_{\infty}$  = 3.00,  $\alpha$  = 0°.

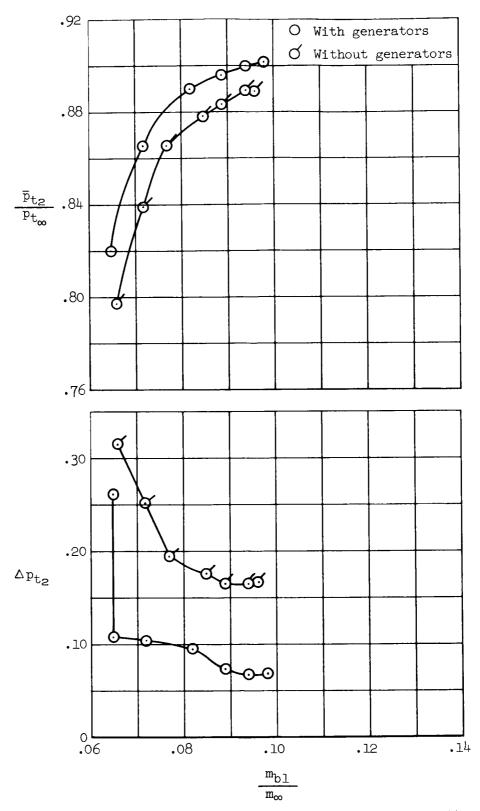


Figure 8.- Effect of vortex generators, 1.50 D inlet; bleed exit setting C,  $(x/R)_{\text{lip}}$  = 2.330;  $M_{\infty}$  = 3.00,  $\alpha$  = 0°.

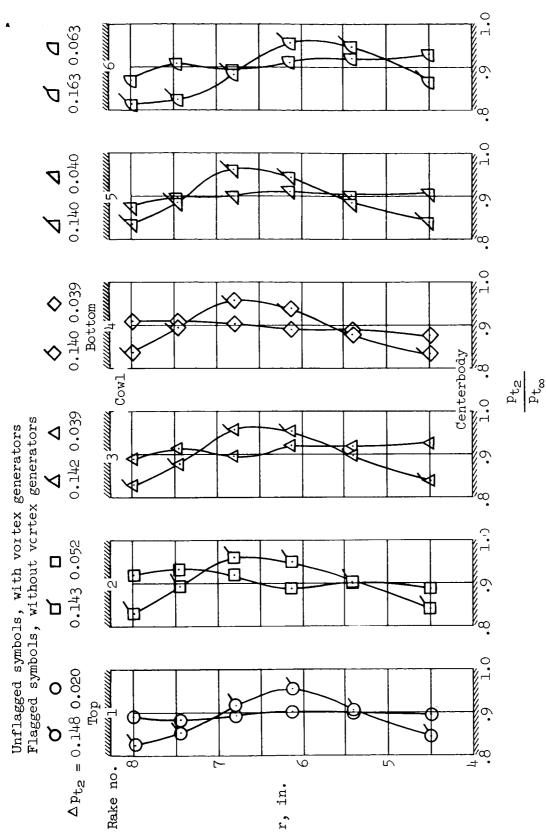
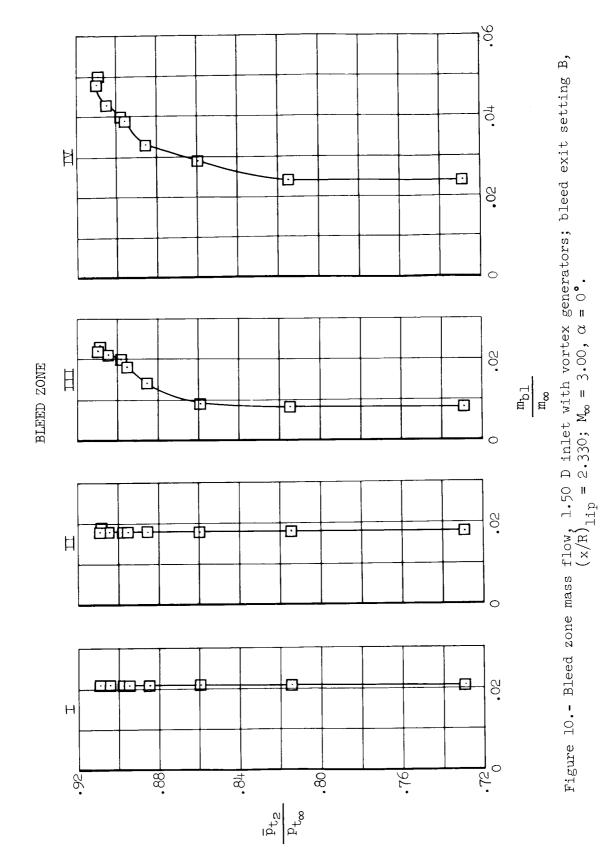


Figure 9.- Total pressure recovery profiles at the engine-face, 1.50 D inlet; bleed exit setting C,  $(x/R)_{1,2} = 2.330$ ;  $M_{\infty} = 3.00$ ,  $\alpha = 0$ .  $_{\rm lip}$  = 2.330;  $M_{\infty}$  = 3.00,  $\alpha$  = 0.



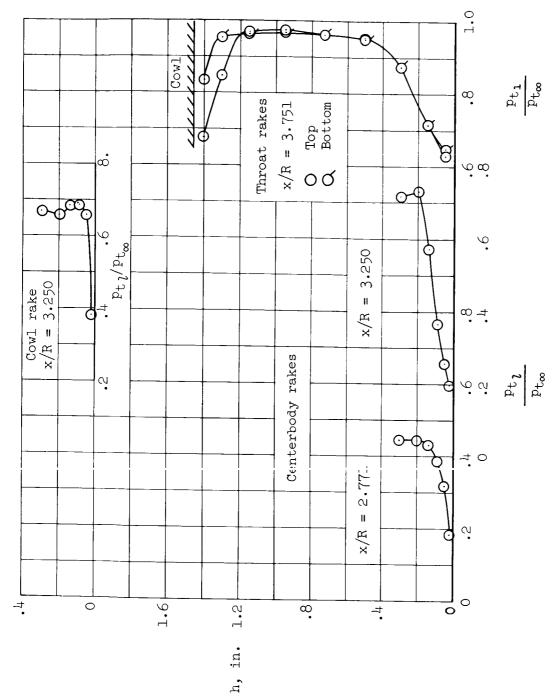
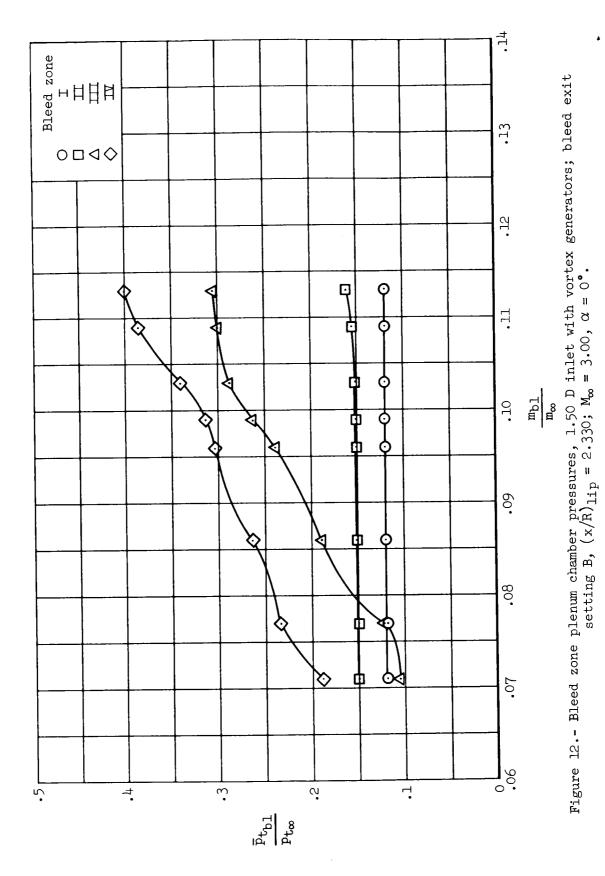


Figure 11.- Pitot pressure profiles, 1.50 D inlet; bleed exit setting B,  $(x/R)_{1ip} = 2.330$ ;  $M_{\infty} = 3.00$ ,  $\alpha = 0$ .



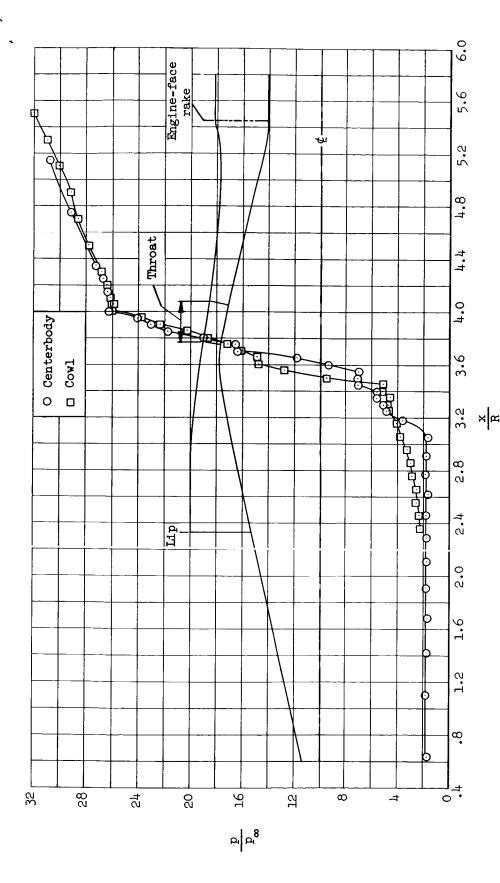


Figure 13.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{1ip} = 2.330$ ;  $M_{\infty} = 3.00$ ,  $\alpha = 0^{\circ}$ . (a)  $\bar{p}_{t_2}/p_{t_{\infty}} = 0.901$ ,  $m_{b_1}/m_{\infty} = 0.109$ .

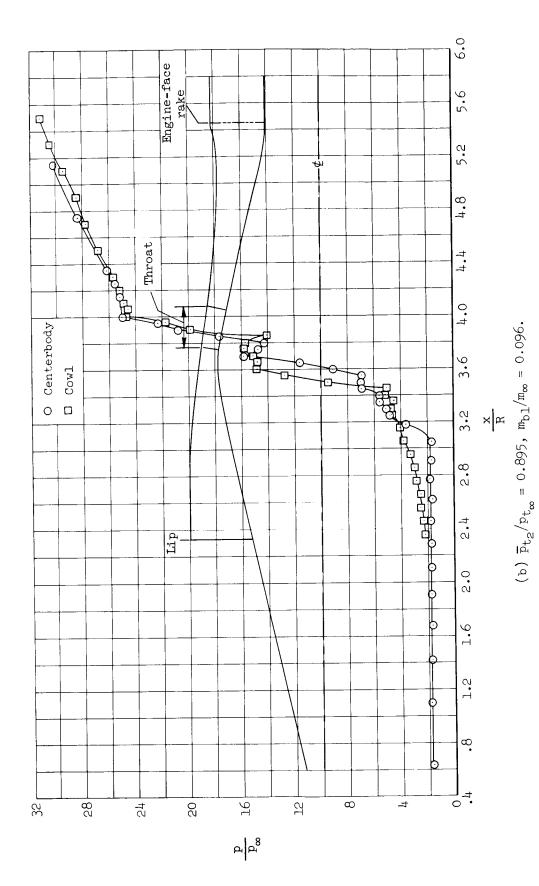
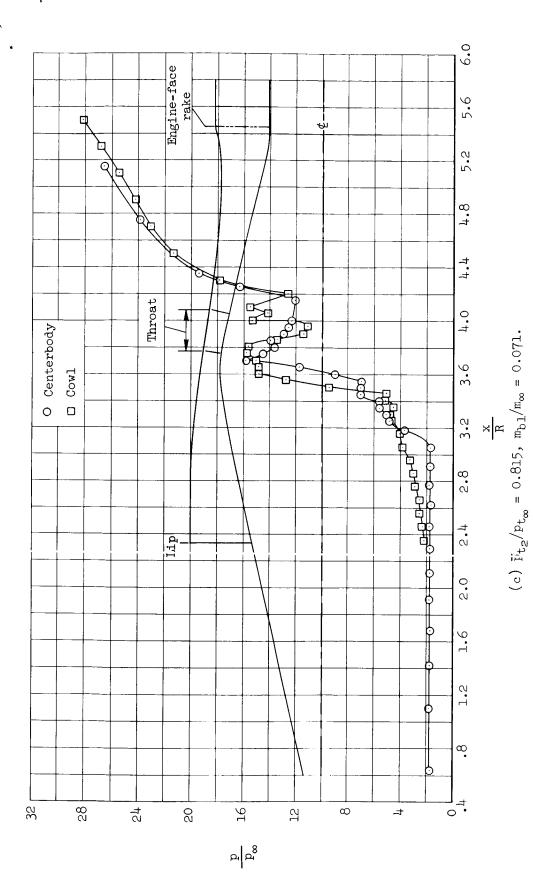


Figure 13.- Continued.



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Figure 13.- Concluded.

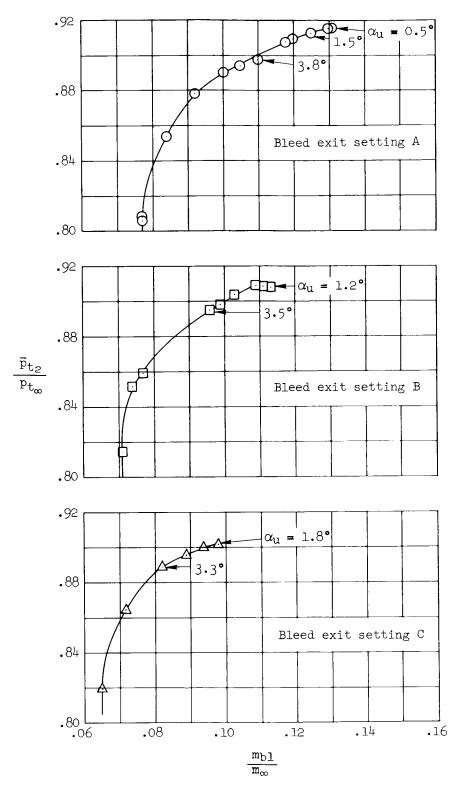


Figure 14.- Inlet unstart angles of attack for various degrees of supercritical operation, 1.50 D inlet with vortex generators;  $(x/R)_{\text{lip}}$  = 2.330,  $M_{\infty}$  = 3.00;  $\alpha$  = 0°.

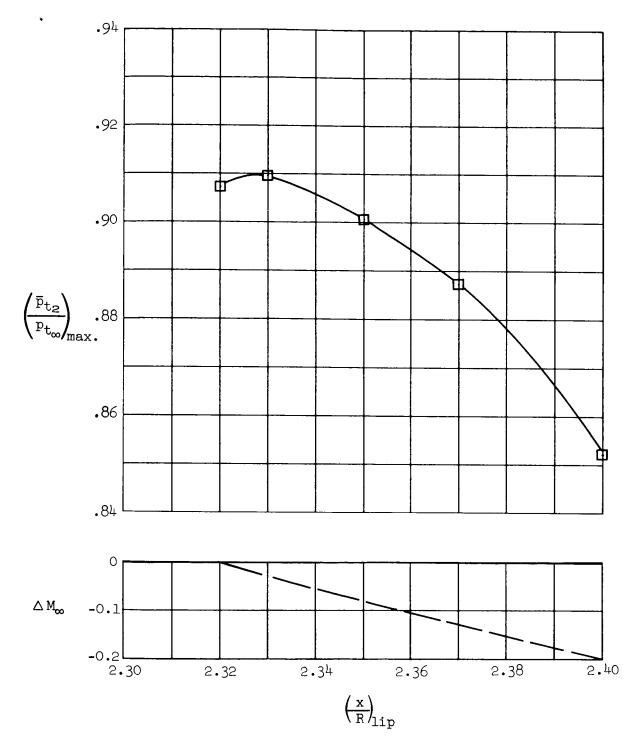


Figure 15.- Sensitivity to Mach number decrement, 1.50 D inlet with vortex generators; bleed exit setting B,  $M_{\infty}$  = 3.00,  $\alpha$  = 0 $^{\circ}$ .

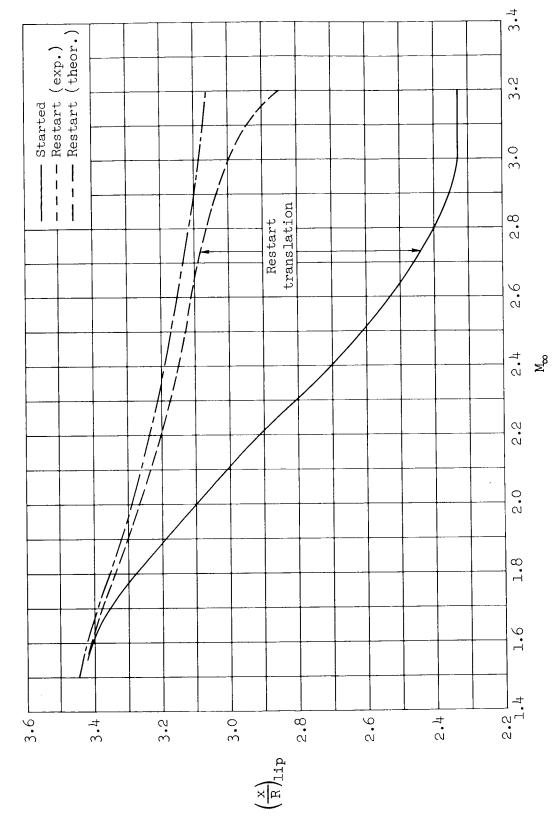


Figure 16.- Restart capability, 1.50 D inlet with vortex generators; bleed exit setting B;  $\alpha = 0^{\circ}$ .

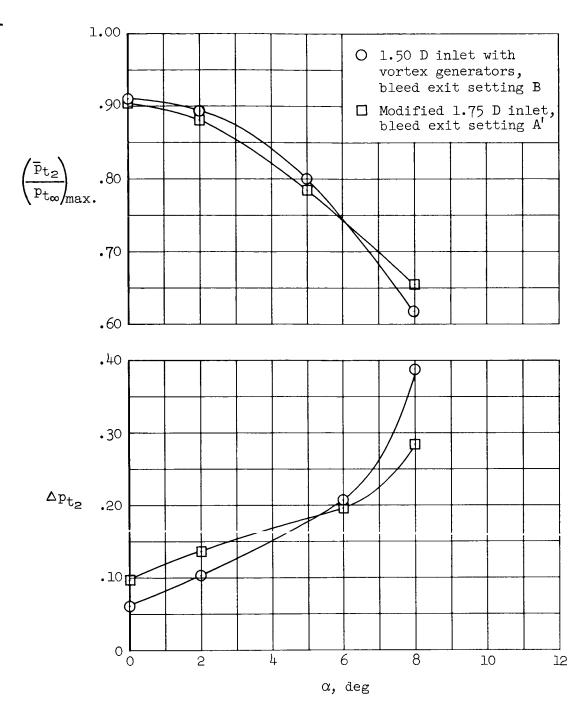


Figure 17.- Maximum performance at angle of attack,  $M_{\infty}$  = 3.00.

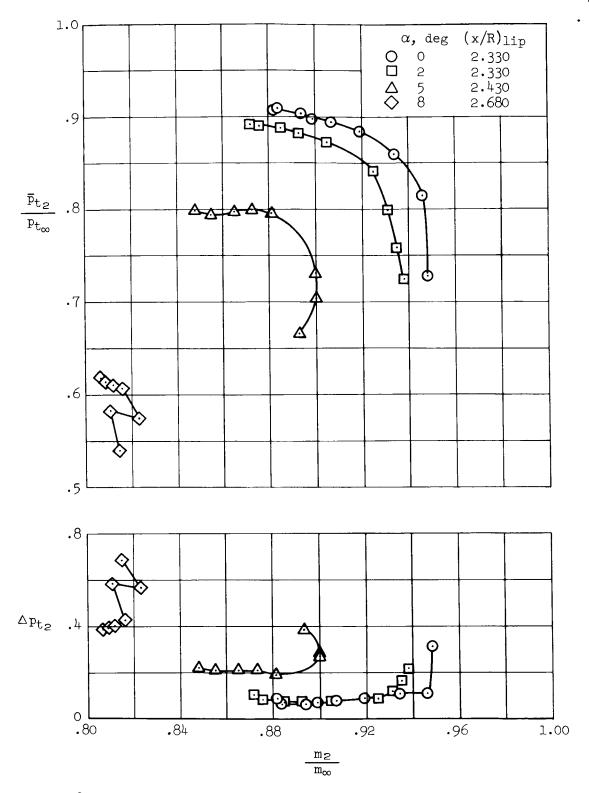


Figure 18.- Supercritical performance at angle of attack, 1.50 D inlet with vortex generators; exit setting B,  $M_{\infty}$  = 3.00.

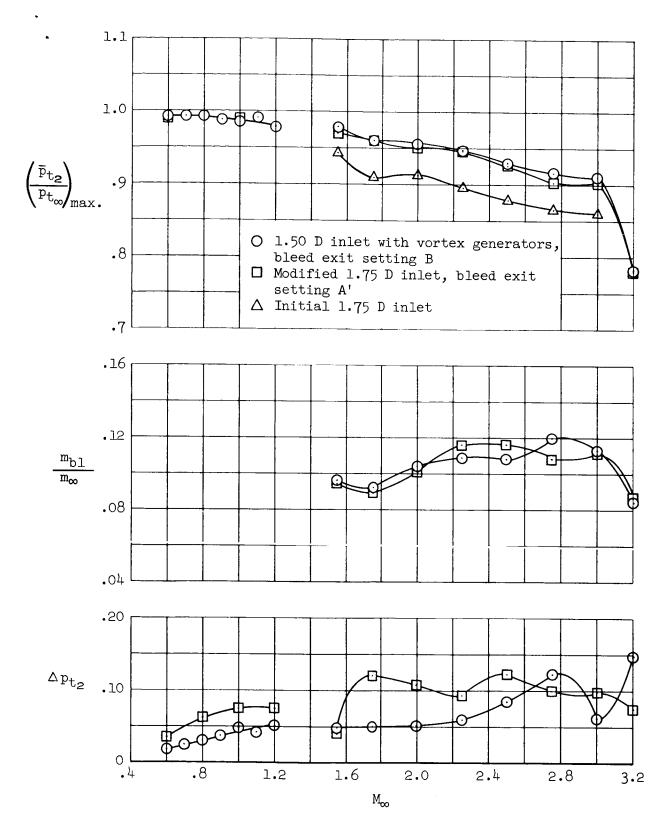


Figure 19.- Off-design maximum performance,  $\alpha$  = 0°.

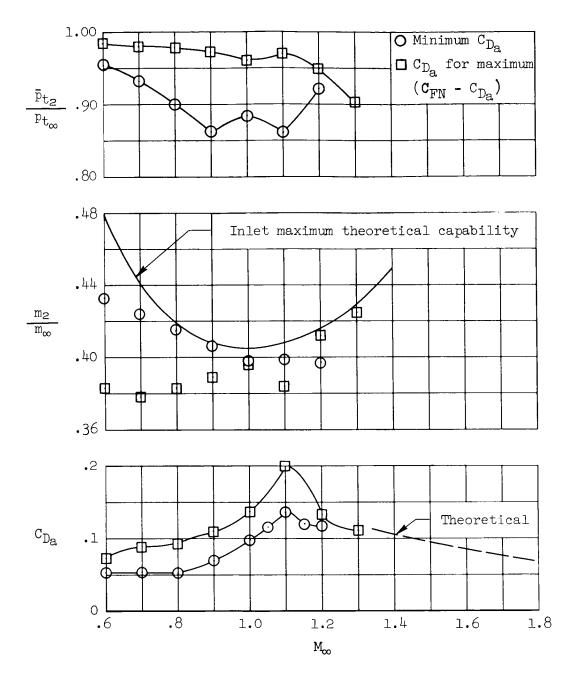


Figure 20.- Transonic performance; bleed exit setting B;  $\alpha$  = 0°.

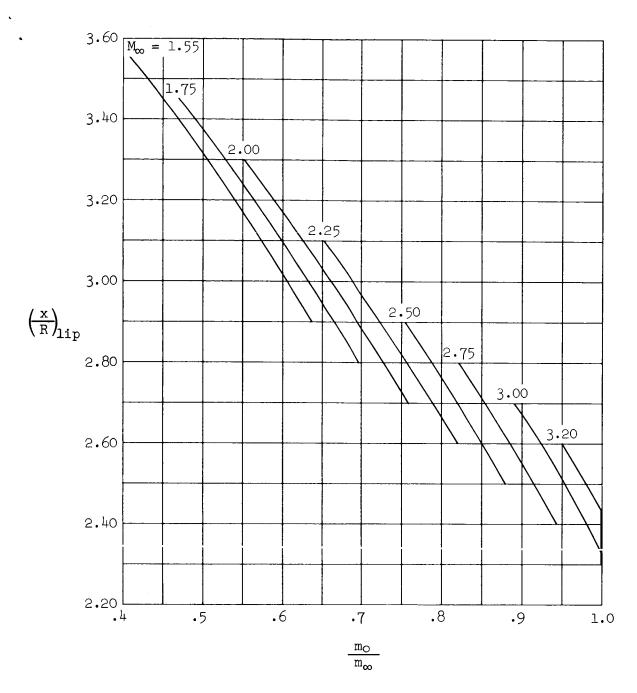


Figure 21.- Inlet theoretical mass-flow ratio,  $\alpha = 0^{\circ}$ .

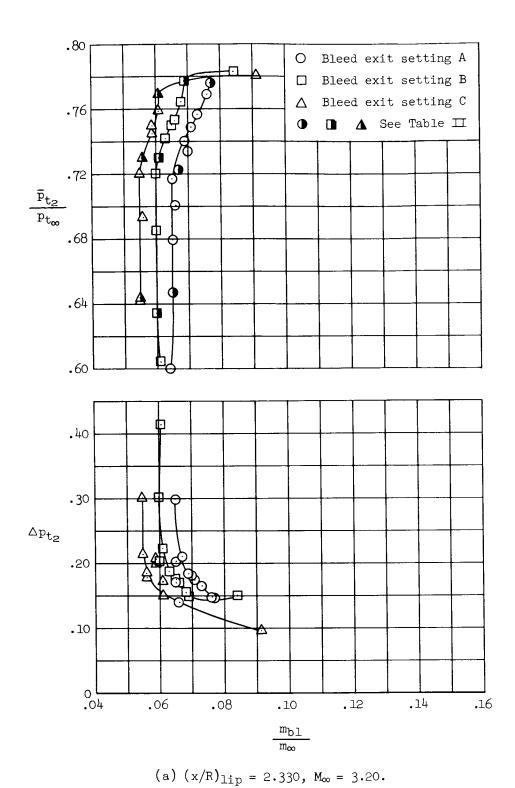
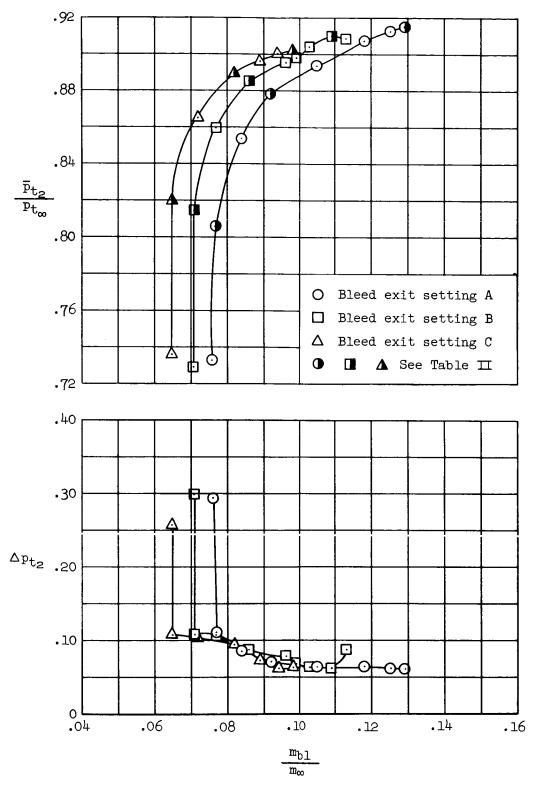
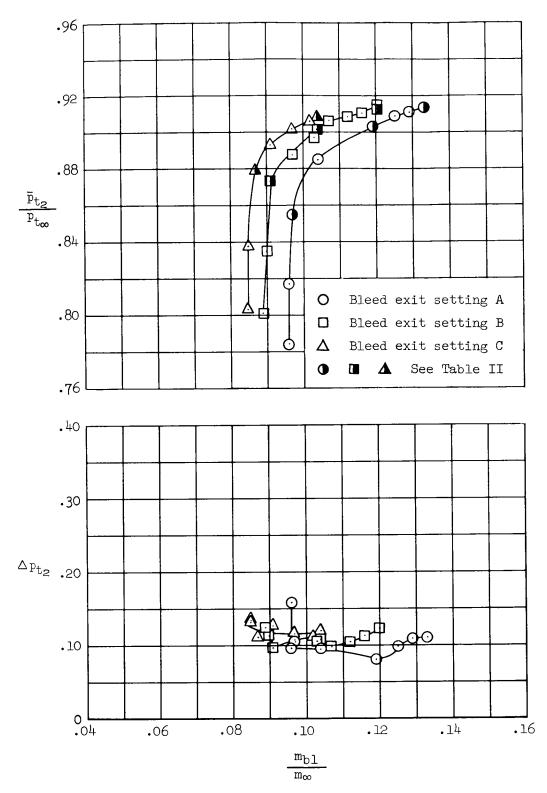


Figure 22.- Supercritical performance, 1.50 D inlet with vortex generators;  $\alpha$  = 0°.



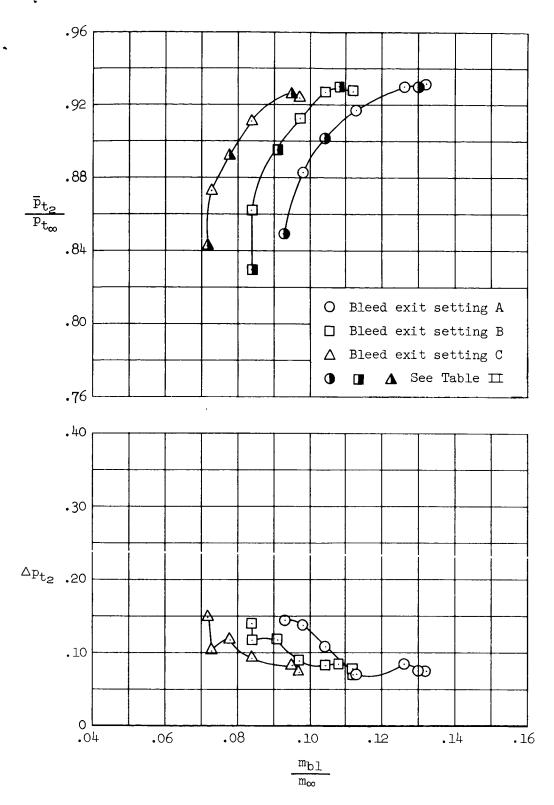
(b)  $(x/R)_{lip} = 2.330$ ,  $M_{\infty} = 3.00$ .

Figure 22.- Continued.



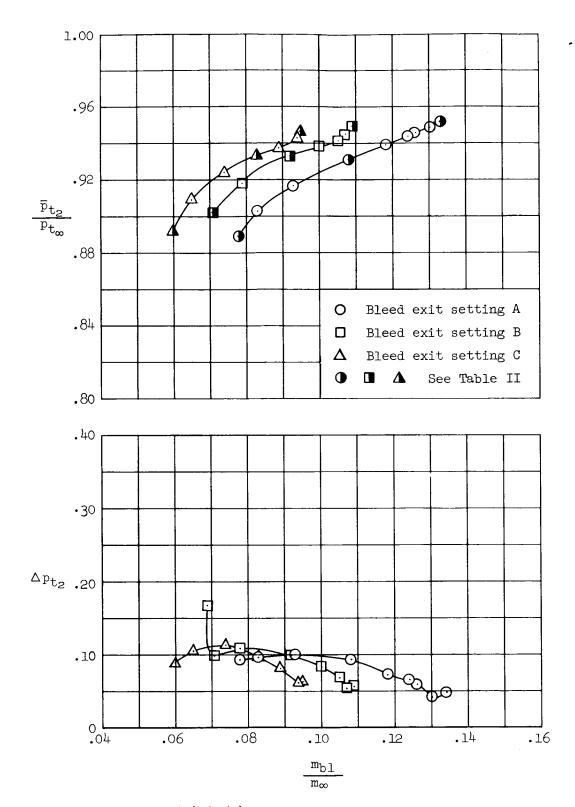
(c)  $(x/R)_{lip} = 2.420$ ,  $M_{\infty} = 2.75$ .

Figure 22.- Continued.



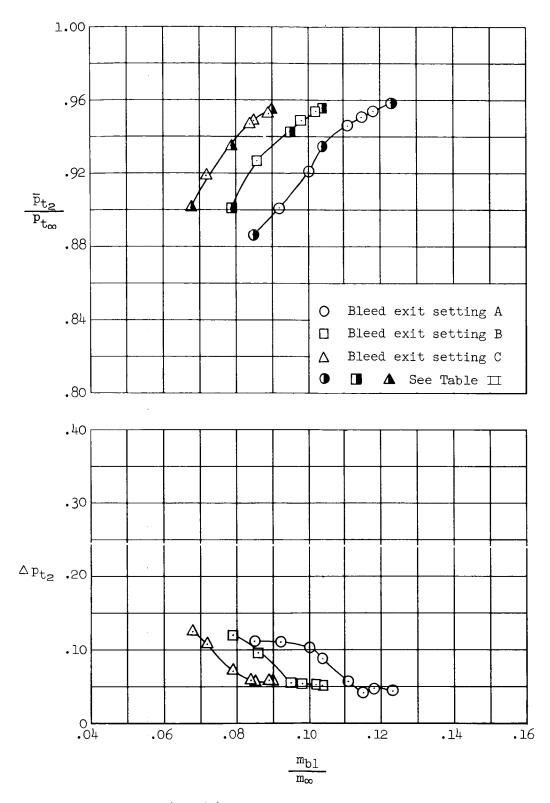
(d)  $(x/R)_{lip} = 2.600$ ,  $M_{\infty} = 2.50$ .

Figure 22.- Continued.



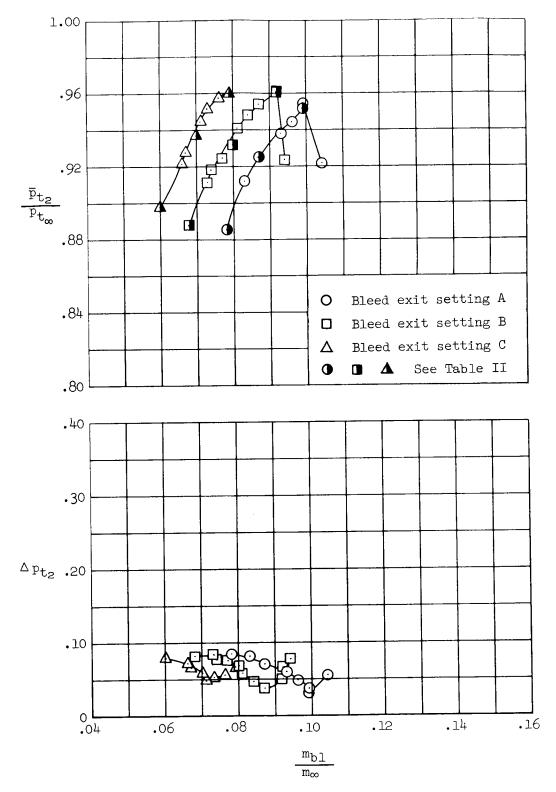
(e)  $(x/R)_{\text{lip}} = 2.860$ ,  $M_{\infty} = 2.25$ .

Figure 22.- Continued.



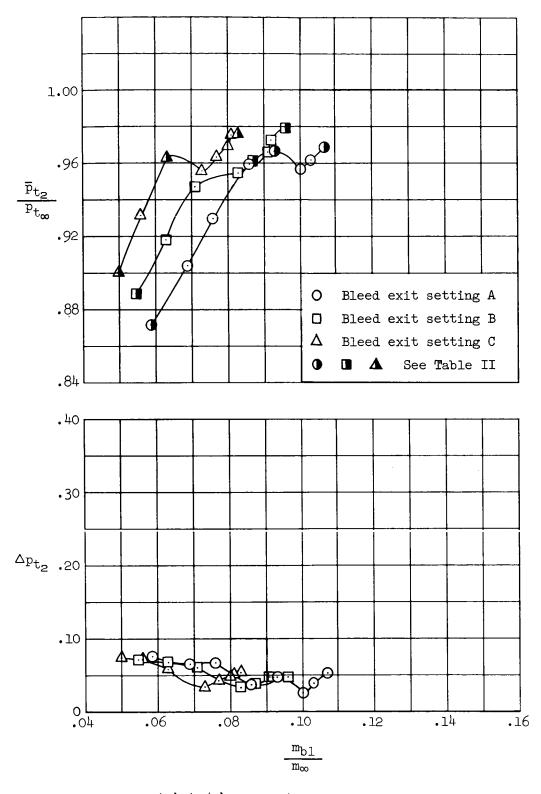
(f)  $(x/R)_{lip} = 3.100$ ,  $M_{\infty} = 2.00$ .

Figure 22.- Continued.



(g)  $(x/R)_{lip} = 3.320$ ,  $M_{\infty} = 1.75$ .

Figure 22. - Continued.



(h)  $(x/R)_{lip} = 3.420$ ,  $M_{\infty} = 1.55$ .

Figure 22.- Concluded.

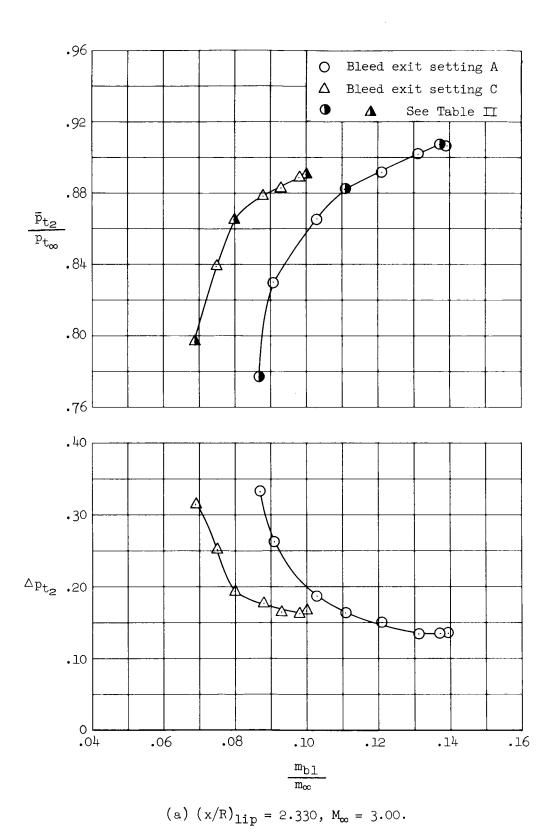
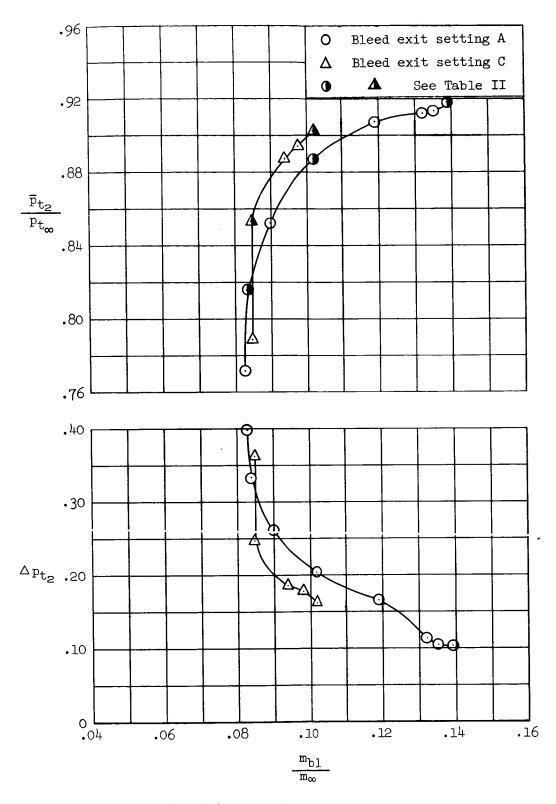
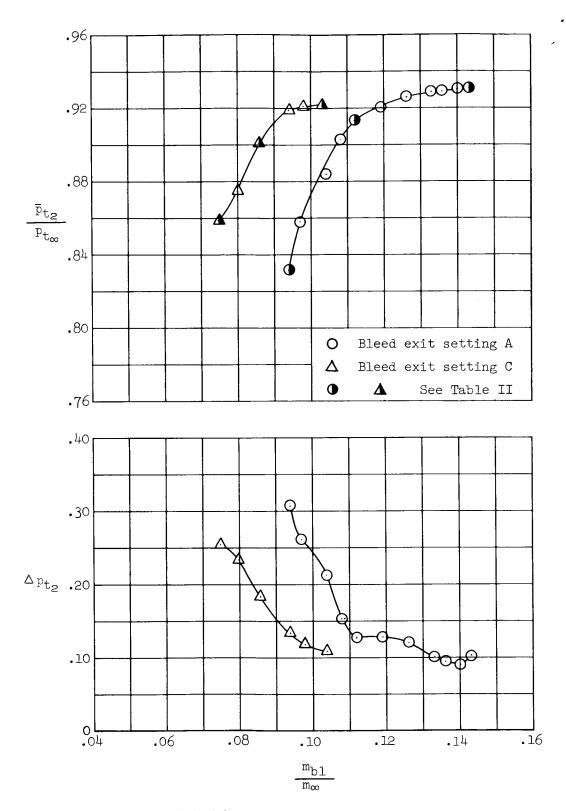


Figure 23.- Supercritical performance, 1.50 D inlet without vortex generators;  $\alpha$  = 0°.

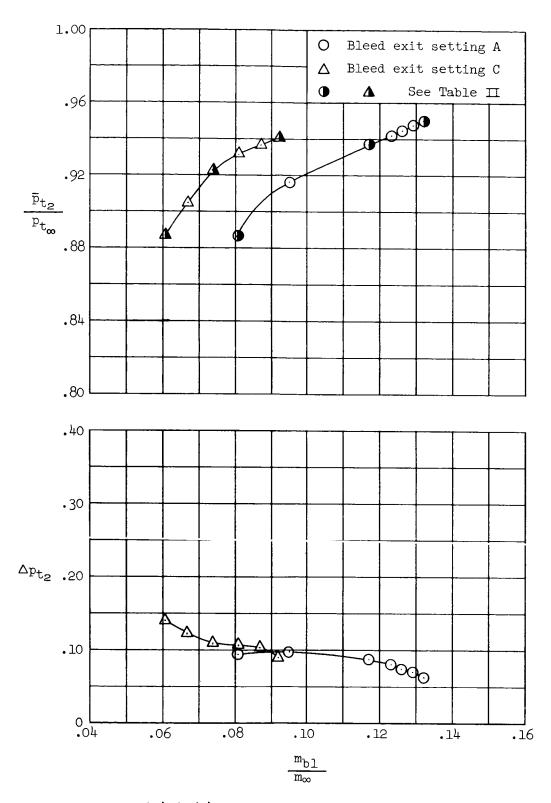


(b)  $(x/R)_{lip} = 2.420$ ,  $M_{\infty} = 2.75$ . Figure 23.- Continued.



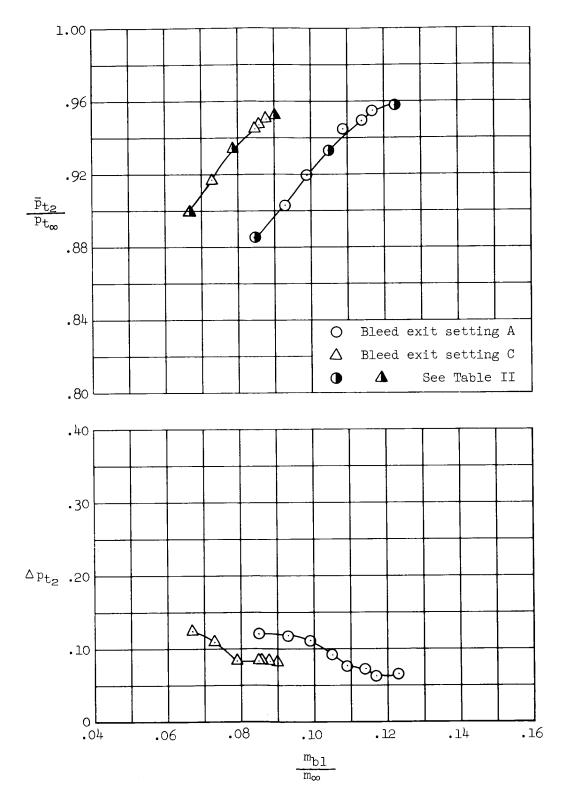
(c)  $(x/R)_{lip} = 2.600$ ,  $M_{\infty} = 2.50$ .

Figure 23.- Continued.



(d)  $(x/R)_{lip} = 2.860$ ,  $M_{\infty} = 2.25$ .

Figure 23.- Continued.



(e)  $(x/R)_{lip} = 3.100$ ,  $M_{\infty} = 2.00$ .

Figure 23.- Continued.

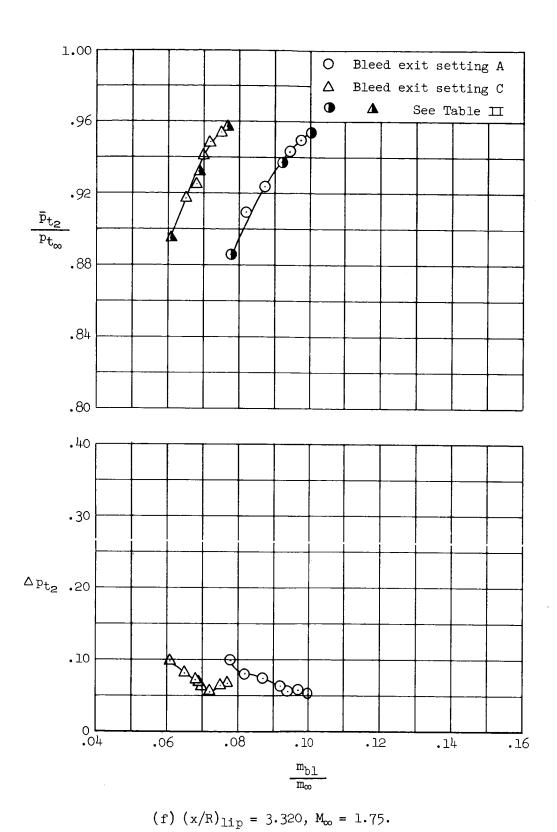
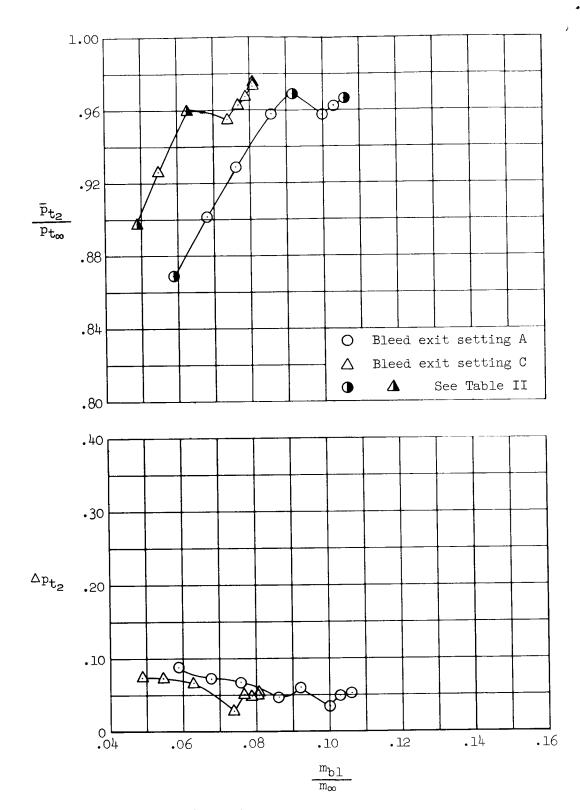


Figure 23.- Continued.



(g)  $(x/R)_{lip} = 3.420$ ,  $M_{\infty} = 1.55$ .

Figure 23.- Concluded.

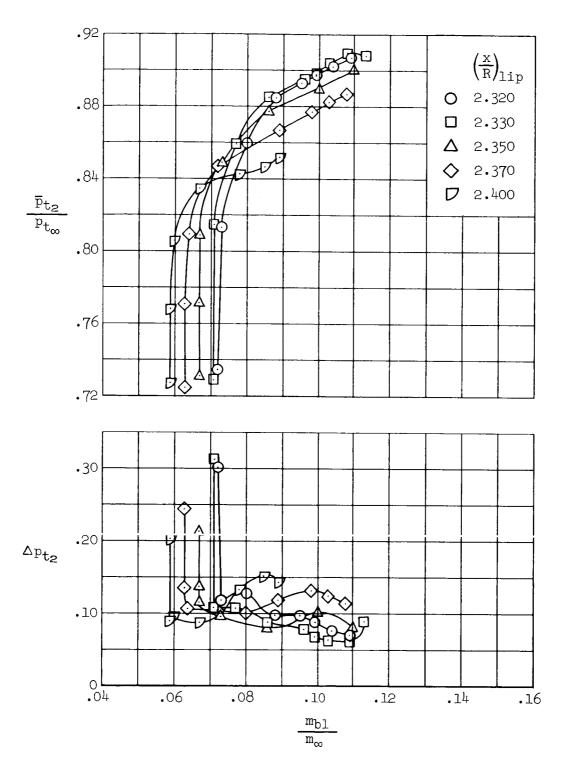


Figure 24.- Supercritical performance, 1.50 D inlet with vortex generators; bleed exit setting B;  $M_{\infty}$  = 3.00,  $\alpha$  = 0°.

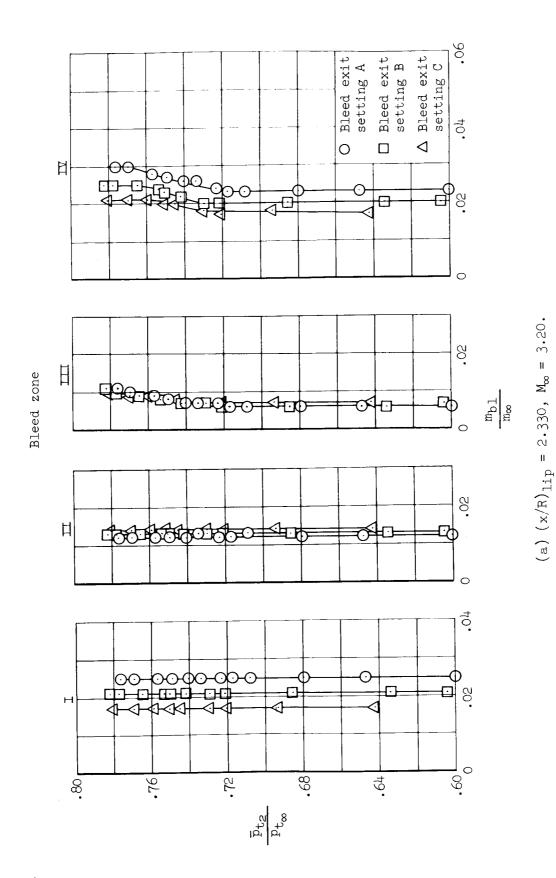
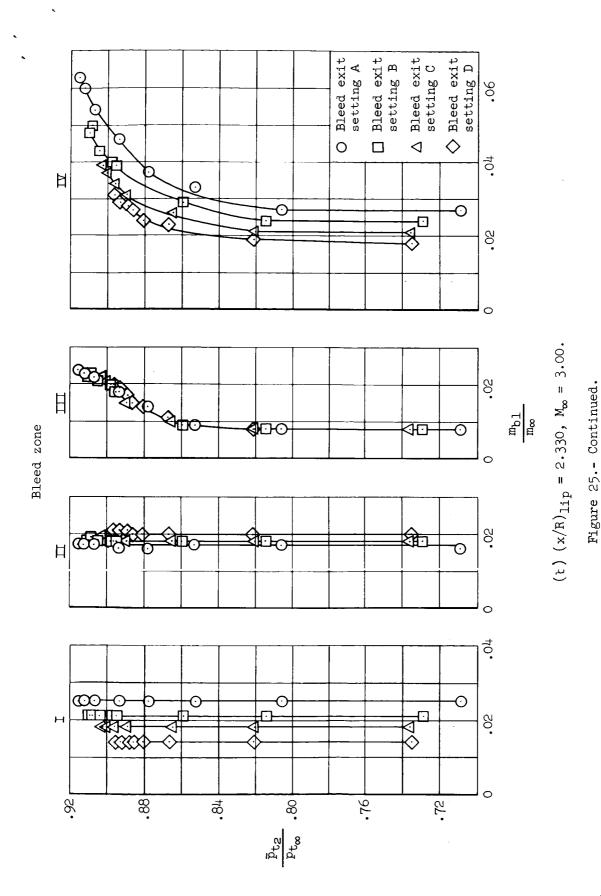
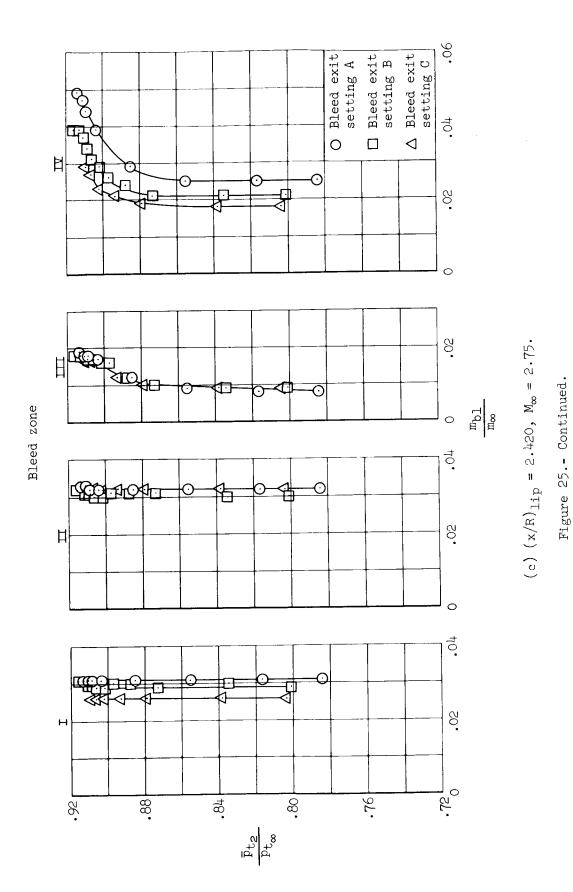
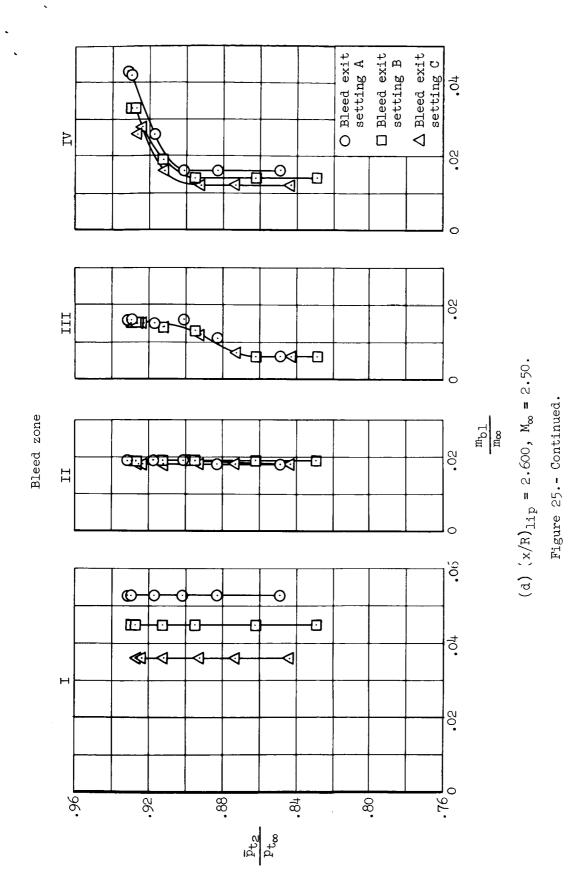
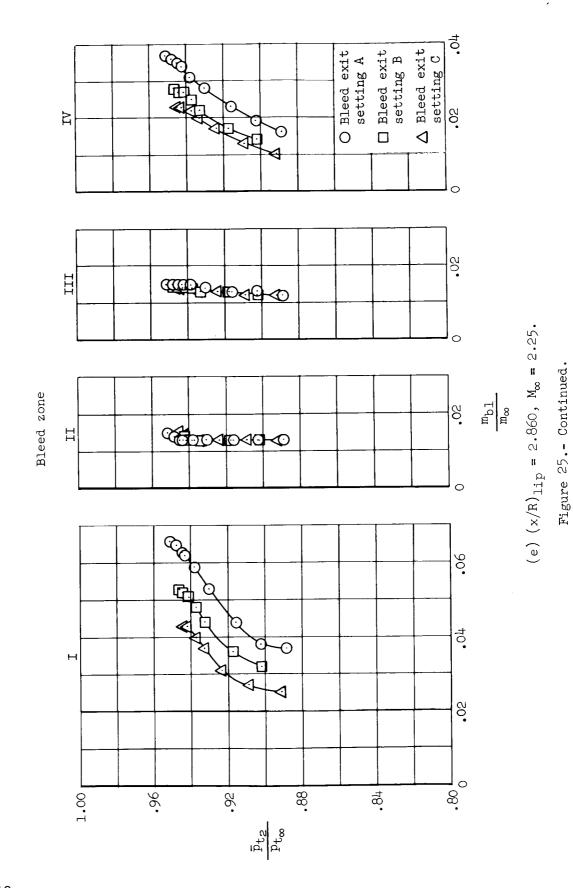


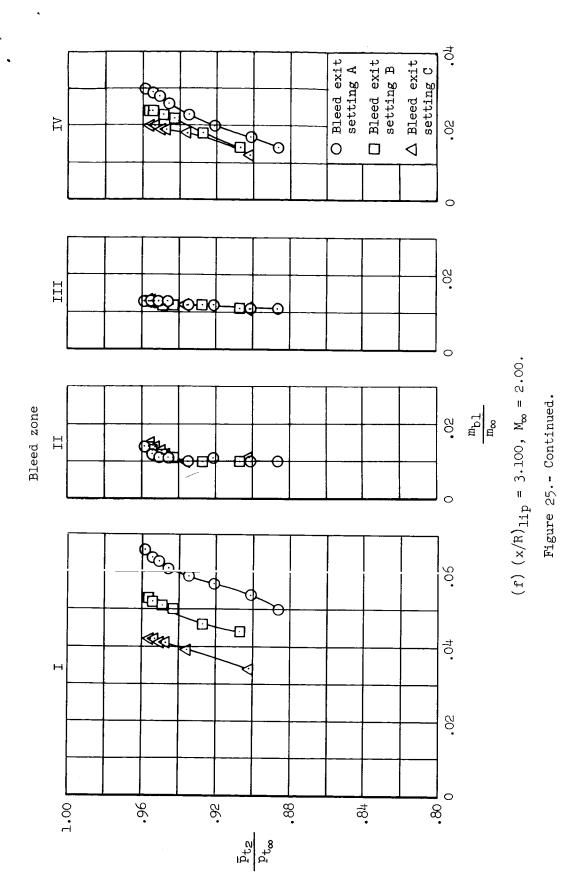
Figure 25.- Bleed zone mass flow, 1.50 D inlet with vortex generators;  $\alpha = 0^{\circ}$ .











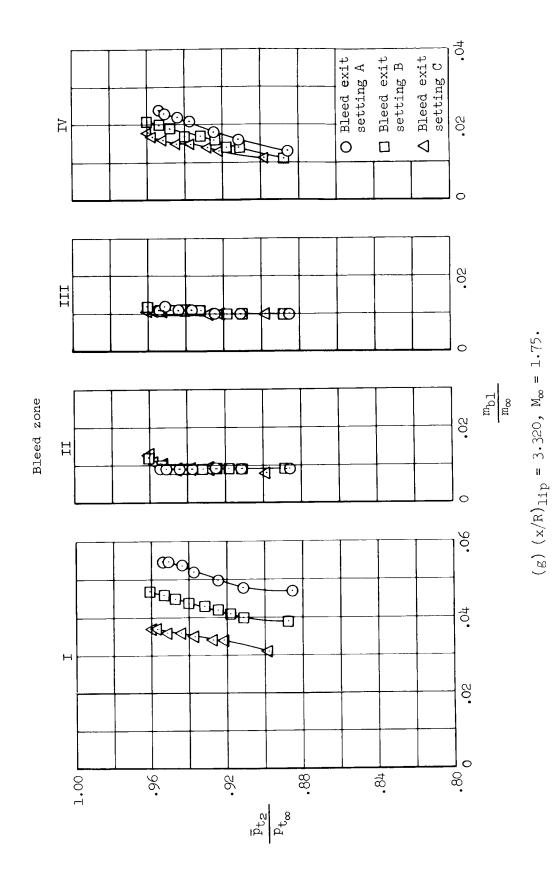
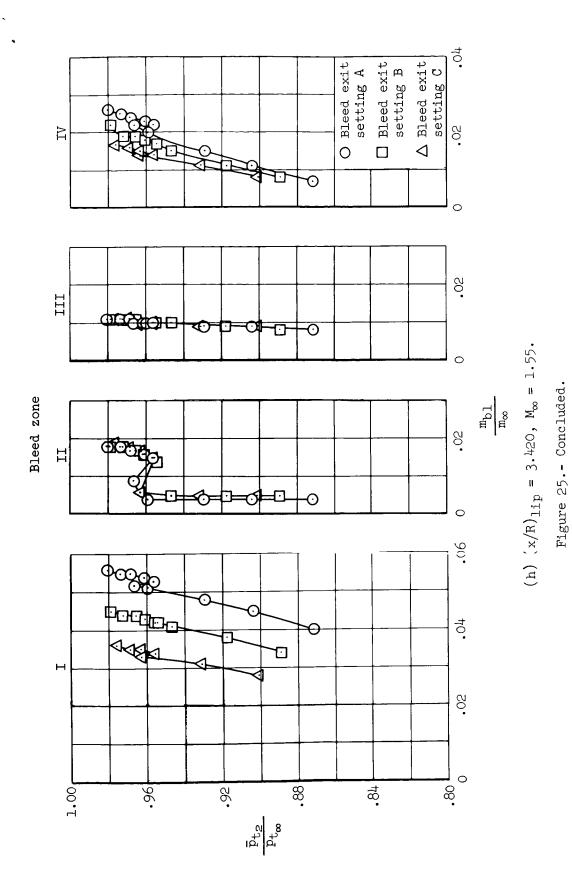


Figure 25.- Continued.

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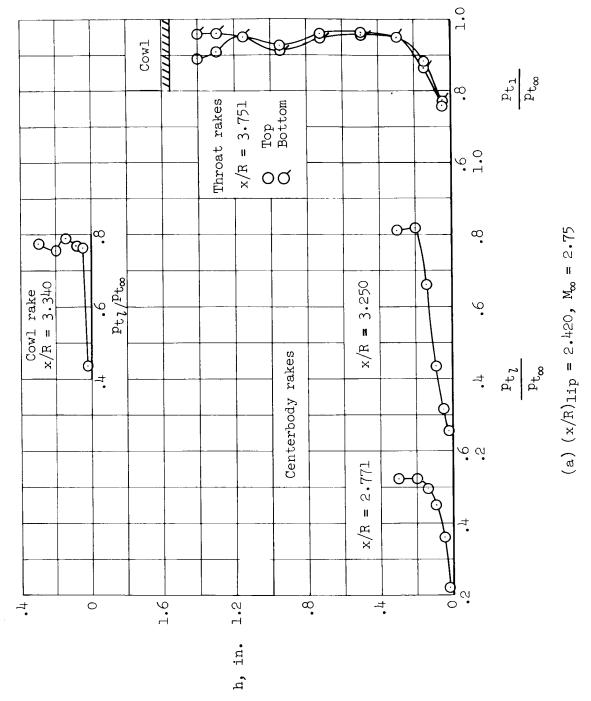
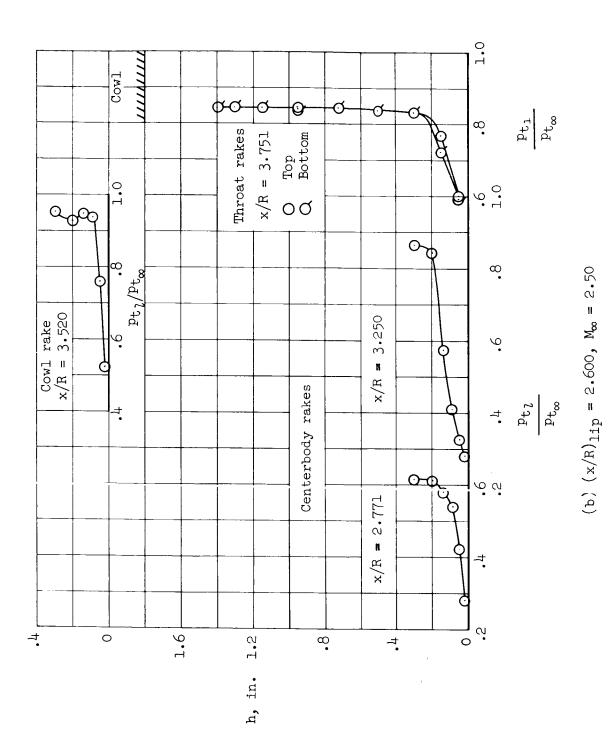


Figure 26.- Pitot pressure profiles, 1.50 D inlet; bleed exit setting B;  $\alpha = 0^{\circ}$ .



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Figure 26.- Continued.

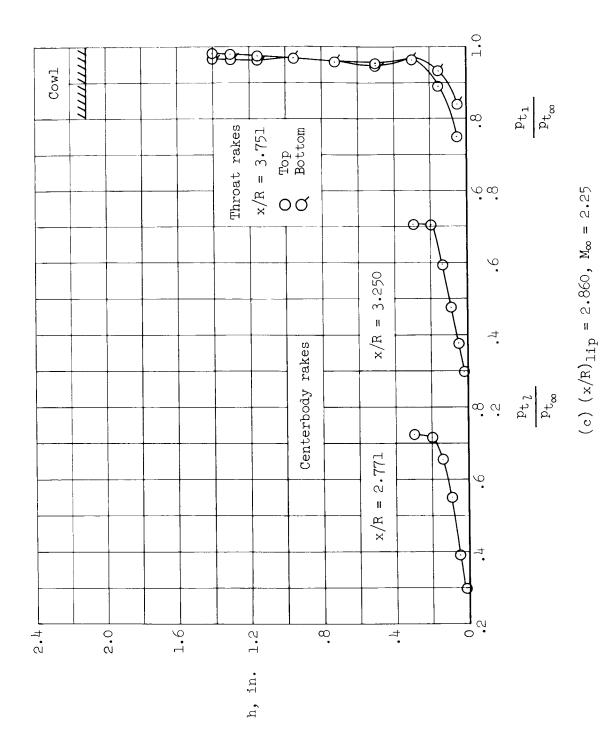


Figure 26.- Continued.

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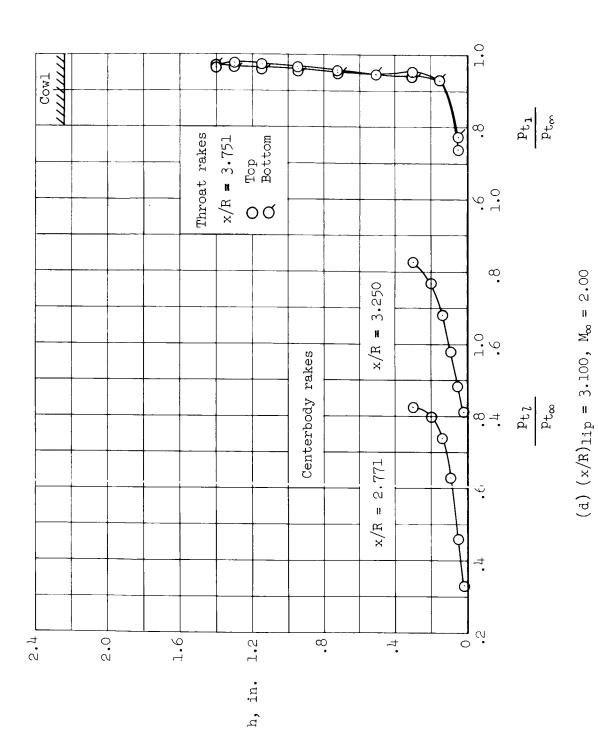


Figure 26.- Continued.

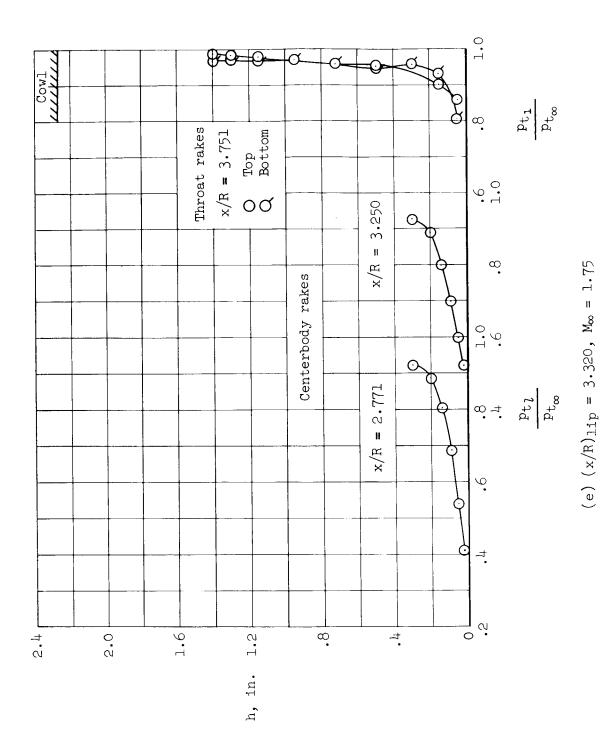


Figure 26.- Continued.

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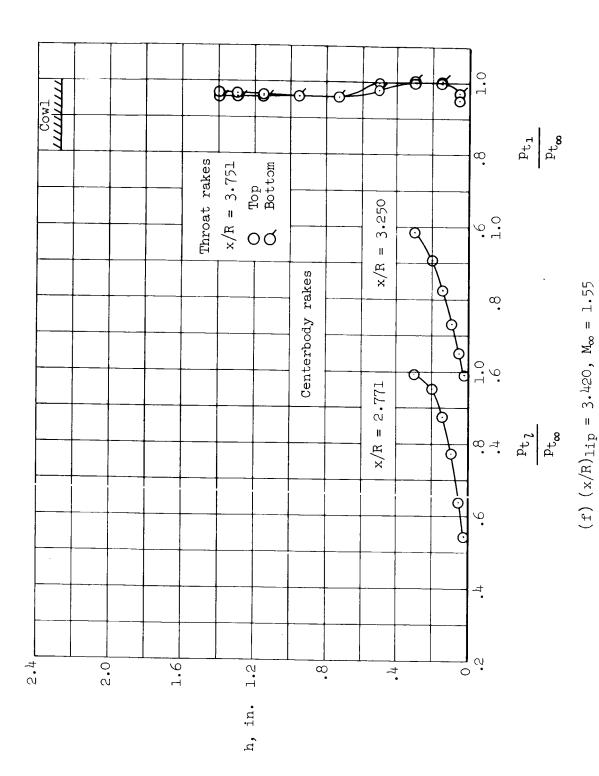


Figure 26.- Concluded.

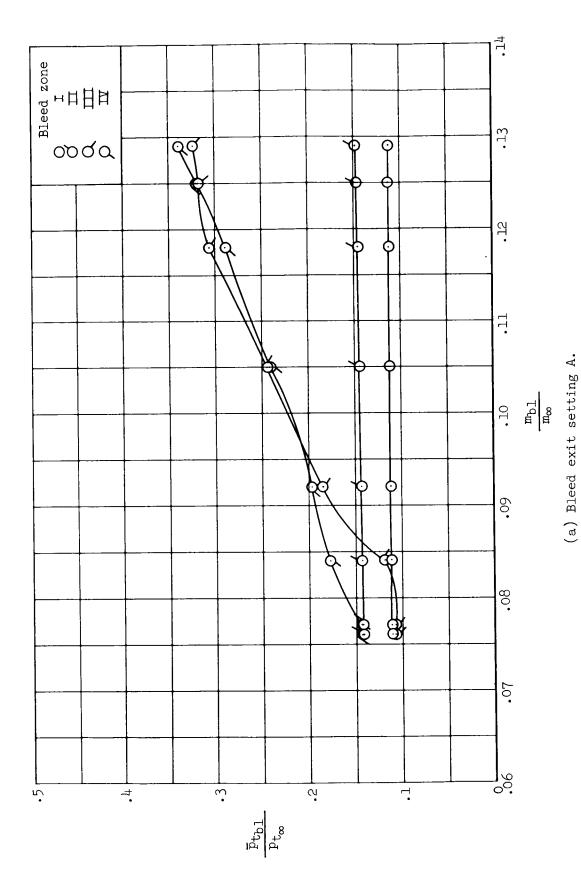
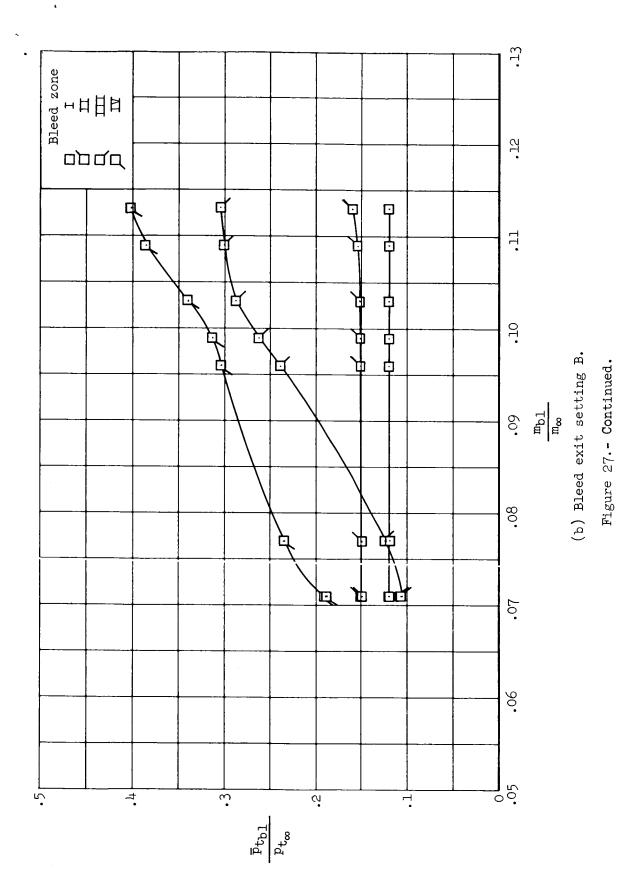
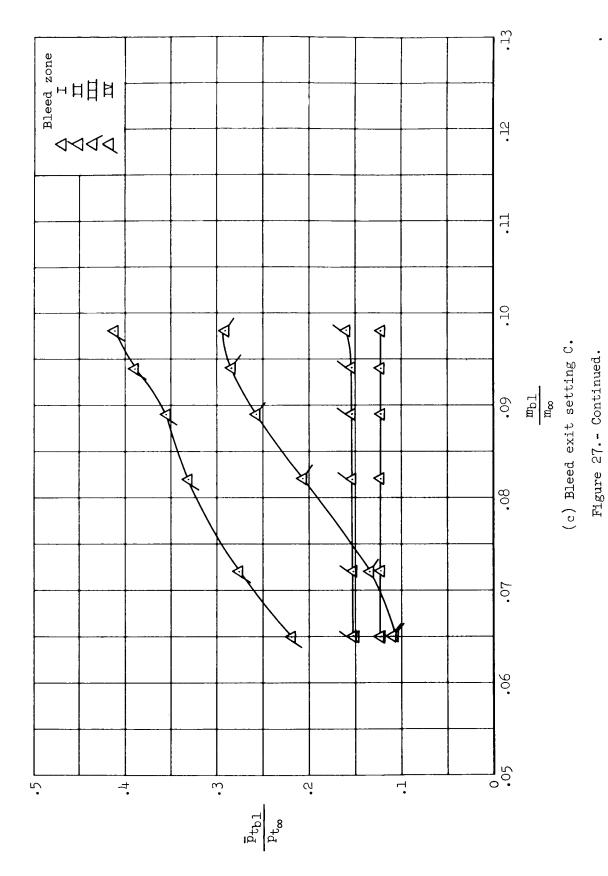
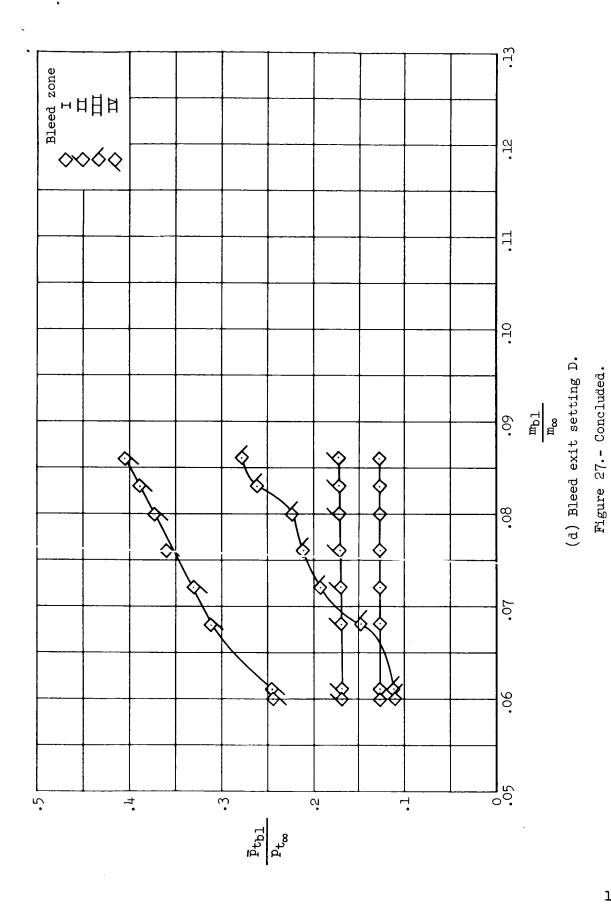


Figure 27.- Bleed plenum chamber pressure recoveries, 1.50 D inlet with vortex generators;  $(x/R)_{1ip} = 2.330$ ,  $M_{\infty} = 3.00$ ;  $\alpha = 0^{\circ}$ .







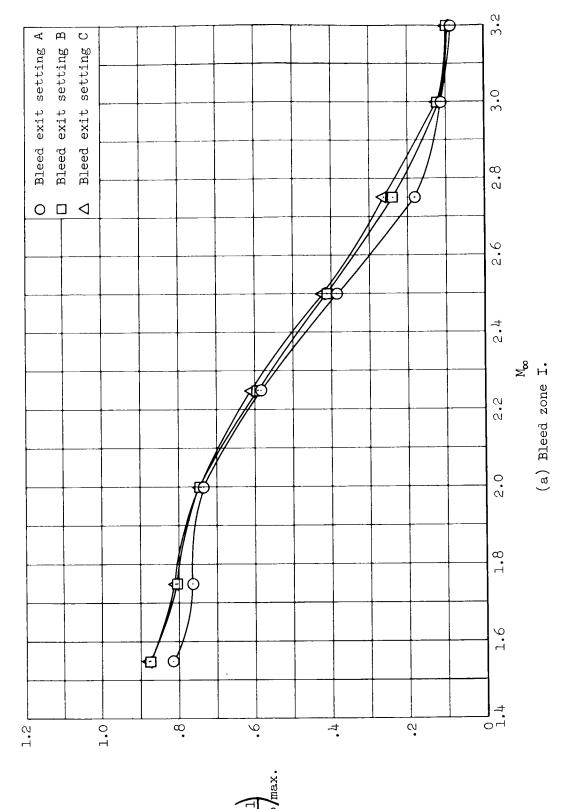
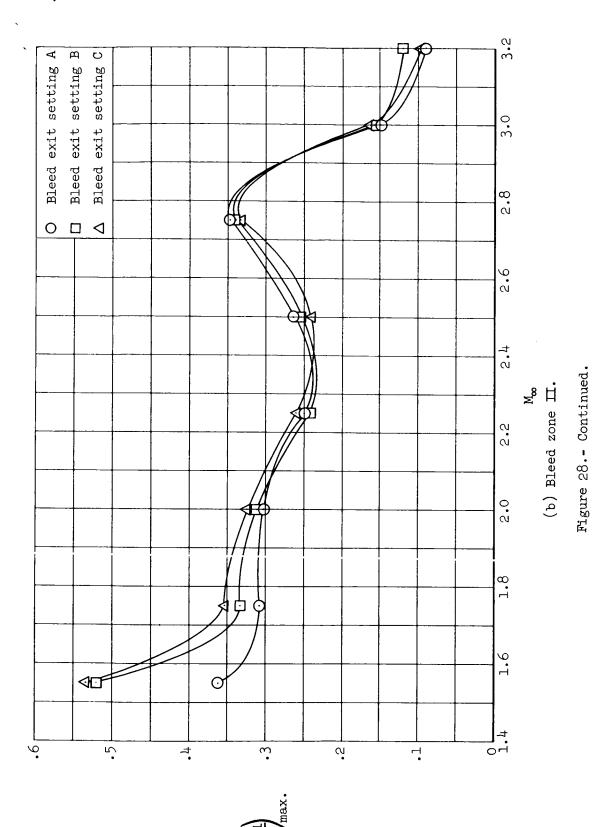
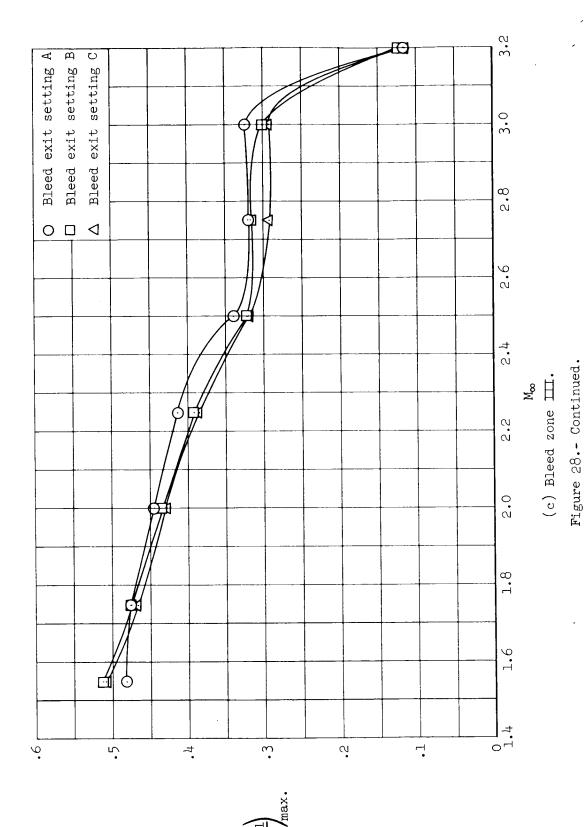
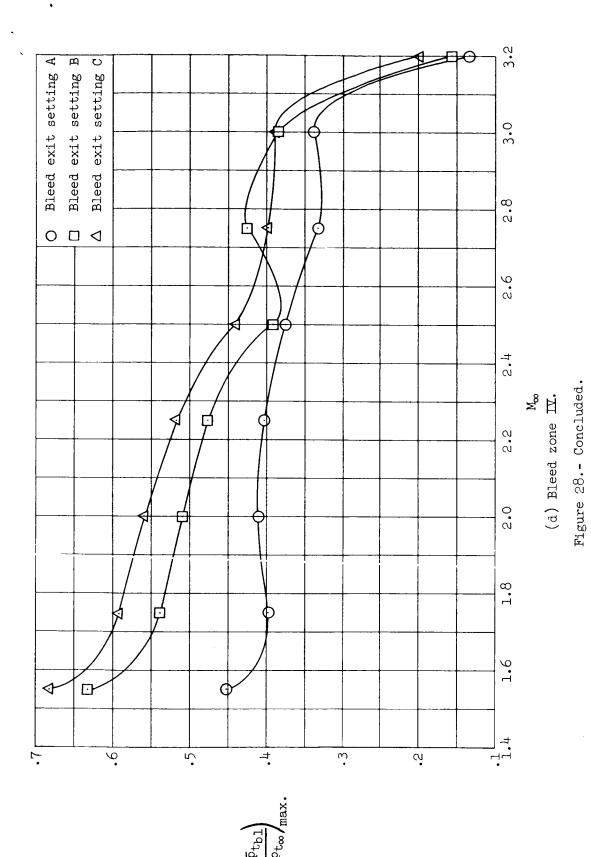


Figure 28.- Maximum bleed plenum chamber pressure recoveries, 1.50 D inlet with vortex generators;  $\alpha = 0^{\bullet}$ .







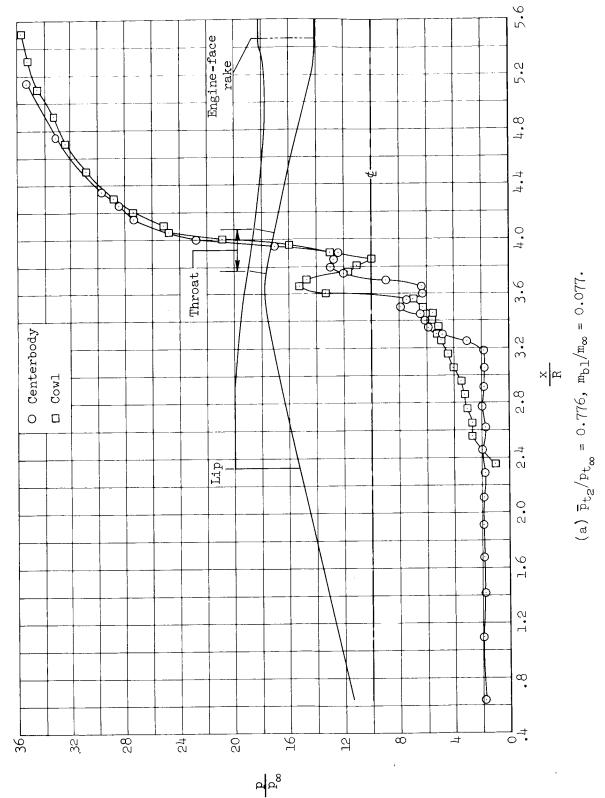


Figure 29.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{lip} = 2.330$ ;  $M_{\infty} = 3.20$ ,  $\alpha = 0^{\circ}$ .

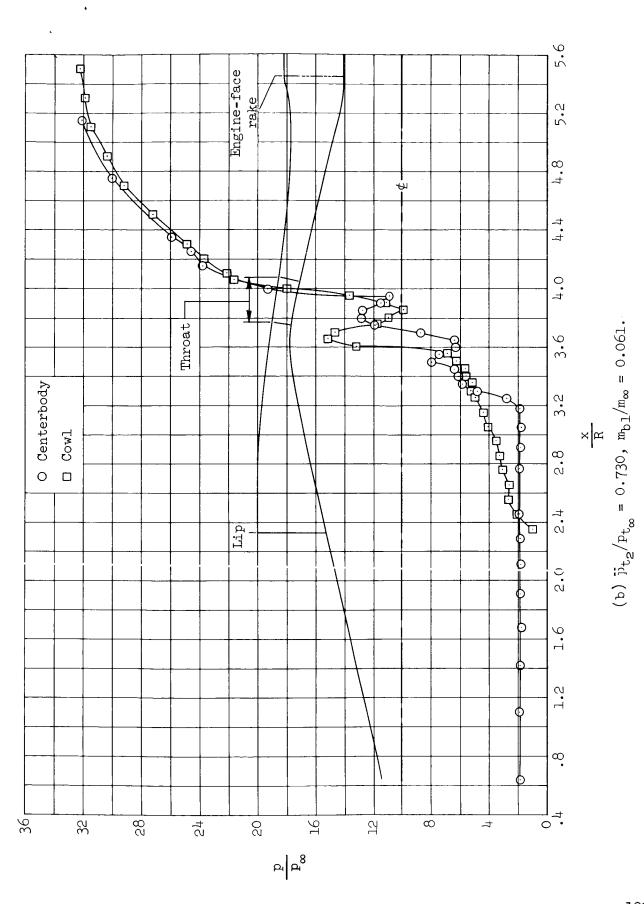


Figure 29.- Continued.

Figure 29.- Concluded.

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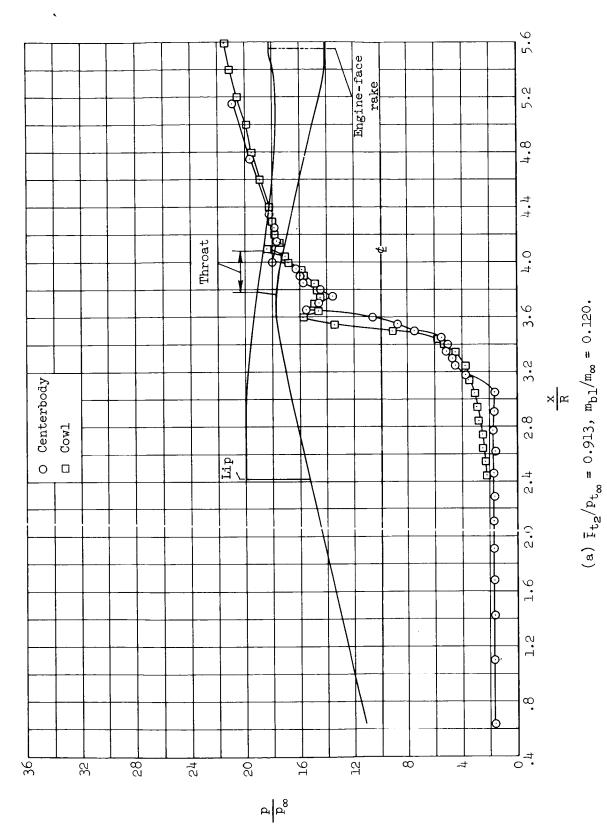
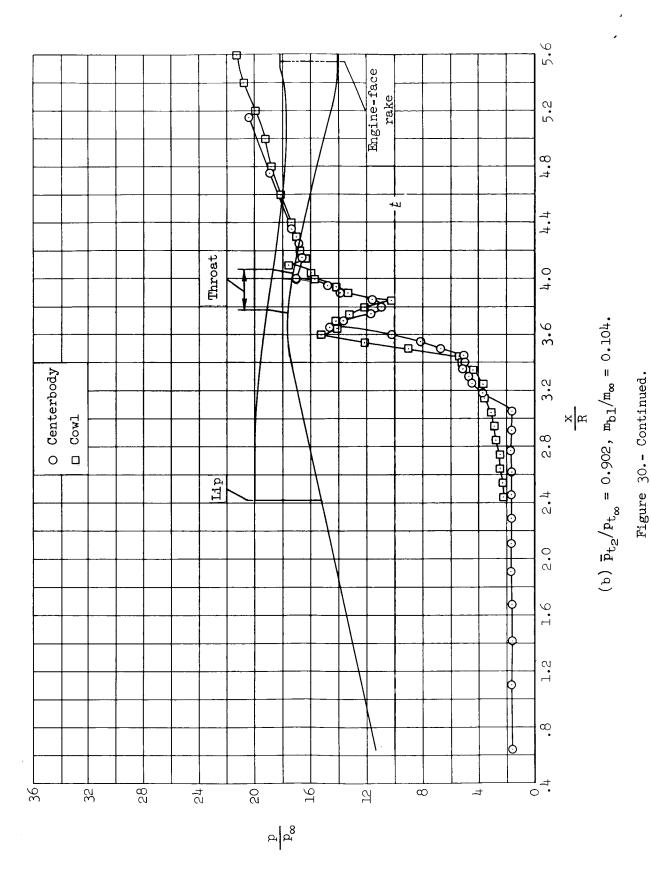


Figure 30.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/F)_{1ip} = 2.420$ ;  $M_{\infty} = 2.75$ ,  $\alpha = 0^{\circ}$ .



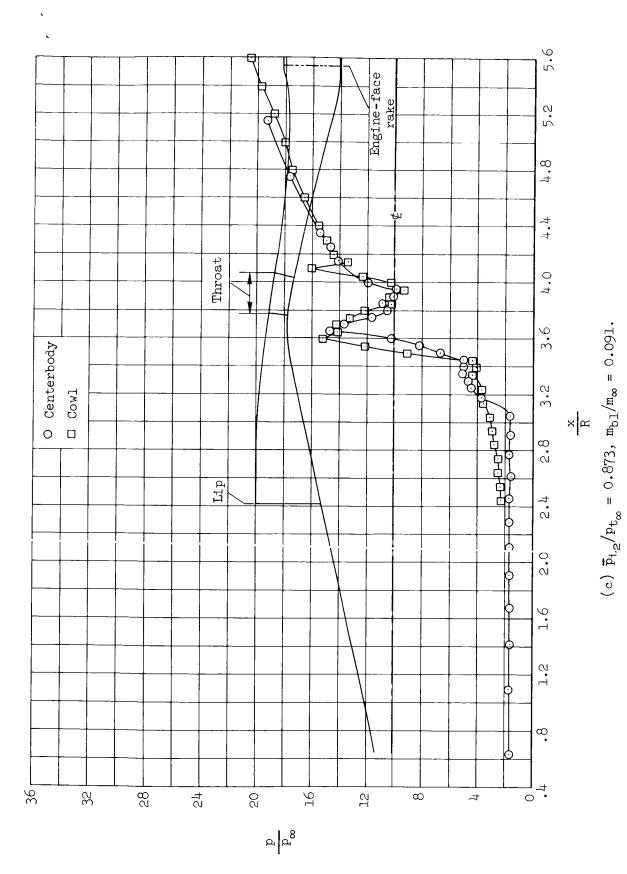


Figure 30.- Concluded.

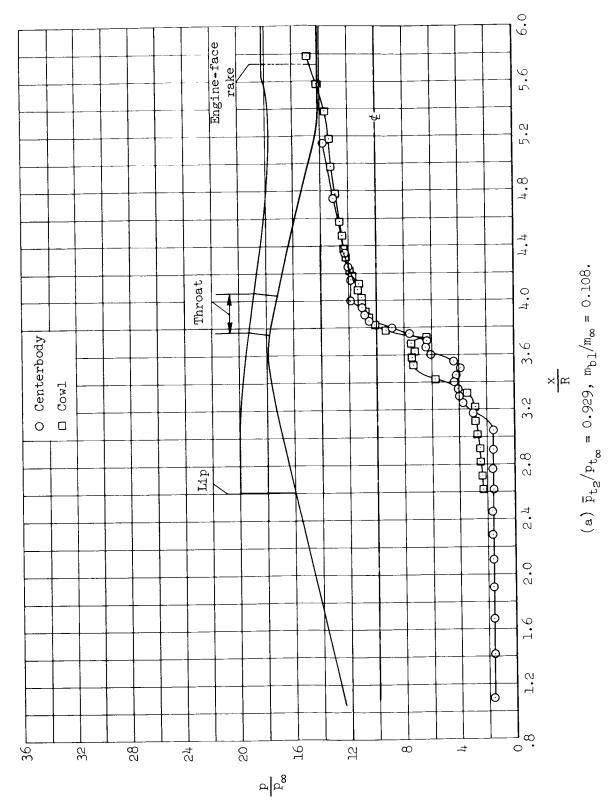


Figure 31.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{lip} = 2.600$ ;  $M_{\infty} = 2.50$ ,  $\alpha = 0^{\circ}$ .

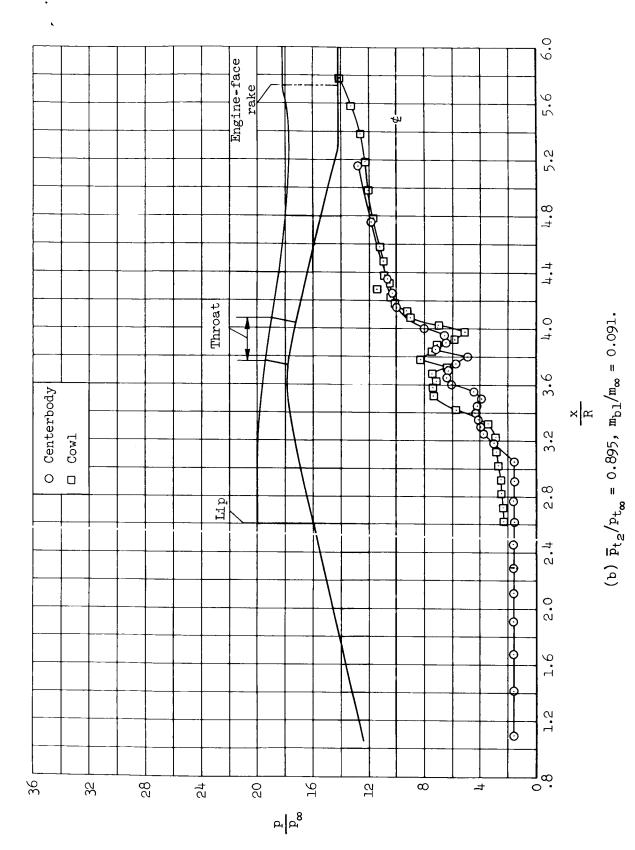
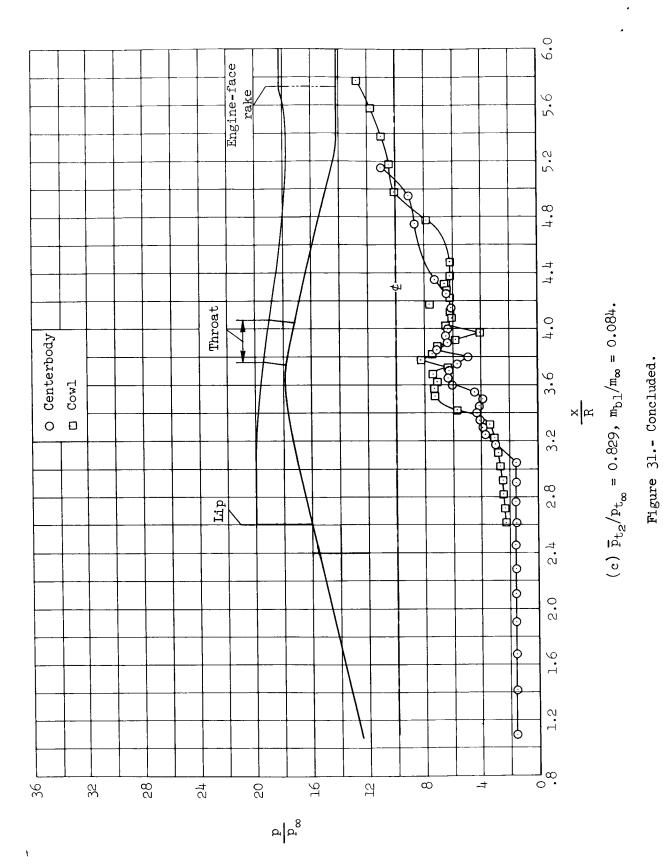


Figure 31.- Continued.



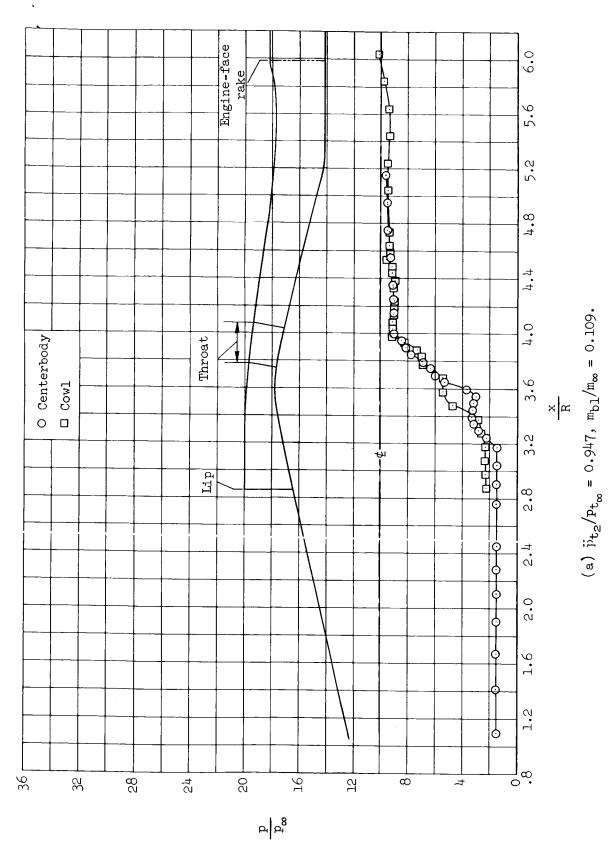


Figure 32.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{1ip} = 2.860$ ;  $M_{\infty} = 2.25$ ,  $\alpha = 0^{\circ}$ .

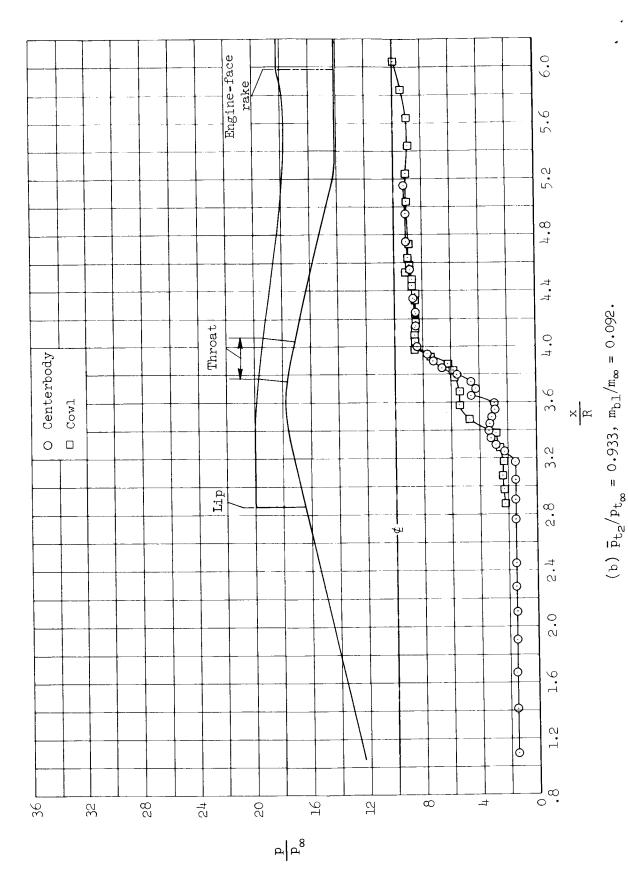


Figure 32.- Continued.

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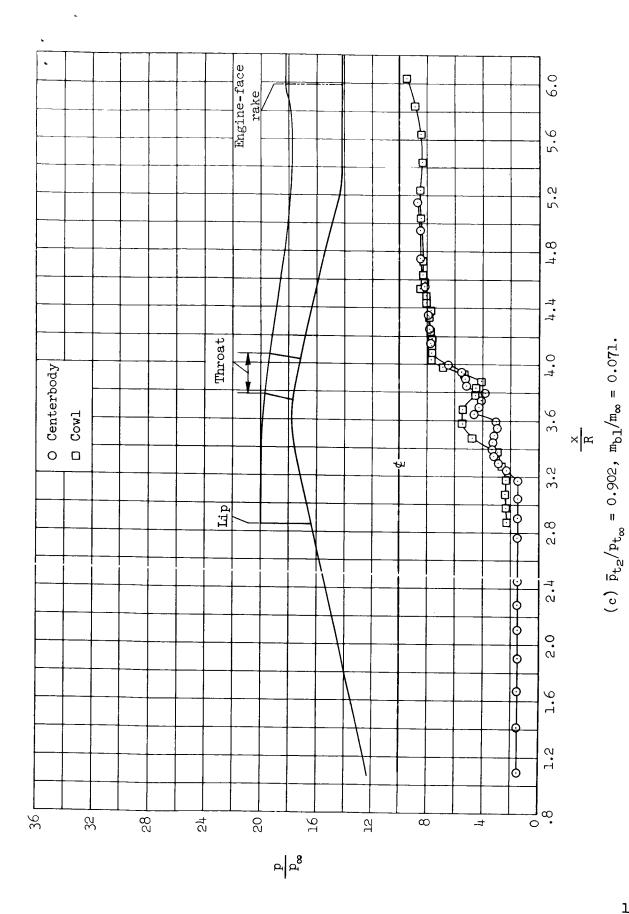


Figure 32.- Concluded.

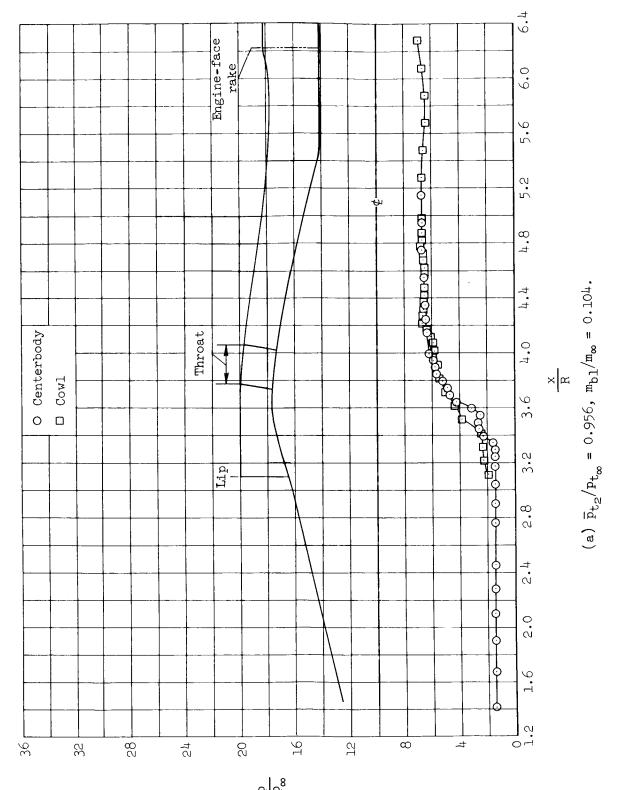


Figure 33.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{lip} = 3.100$ ;  $M_{\infty} = 2.00$ ,  $\alpha = 0^{\circ}$ .

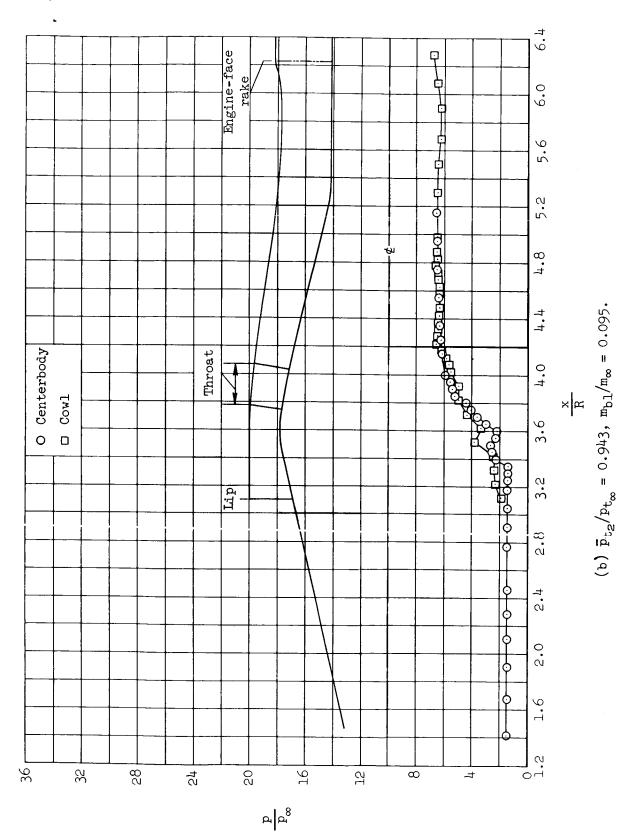


Figure 33.- Continued.

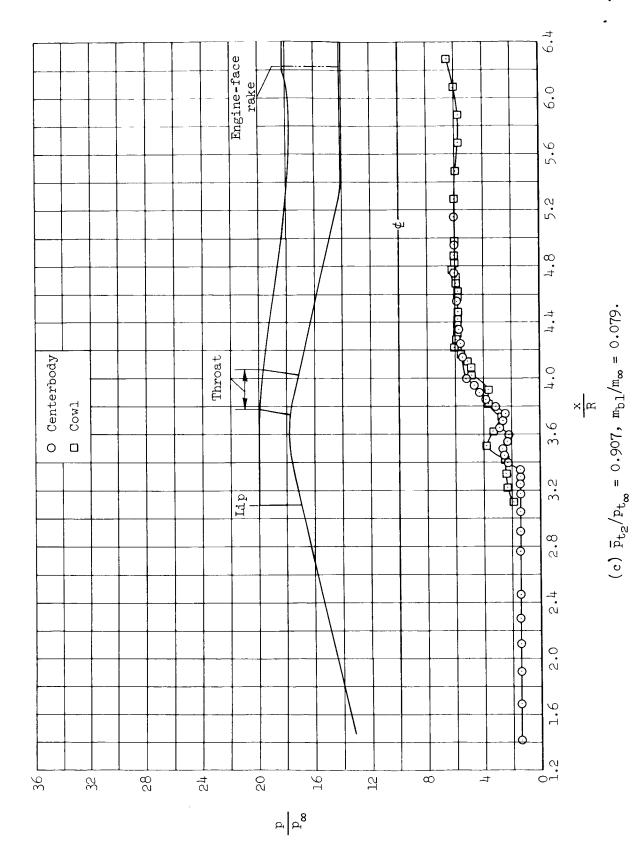


Figure 33.- Concluded.

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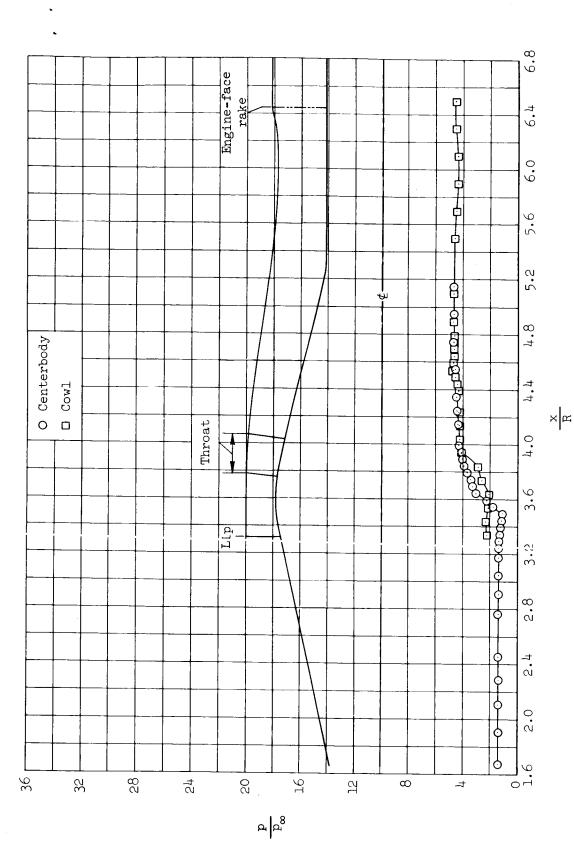


Figure 34.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{1ip} = 3.320$ ;  $M_{\infty} = 1.75$ ,  $\alpha = 0$ °. (a)  $\bar{p}_{t_2}/p_{t_{\infty}} = 0.960$ ,  $m_{b_1}/m_{\infty} = 0.092$ .

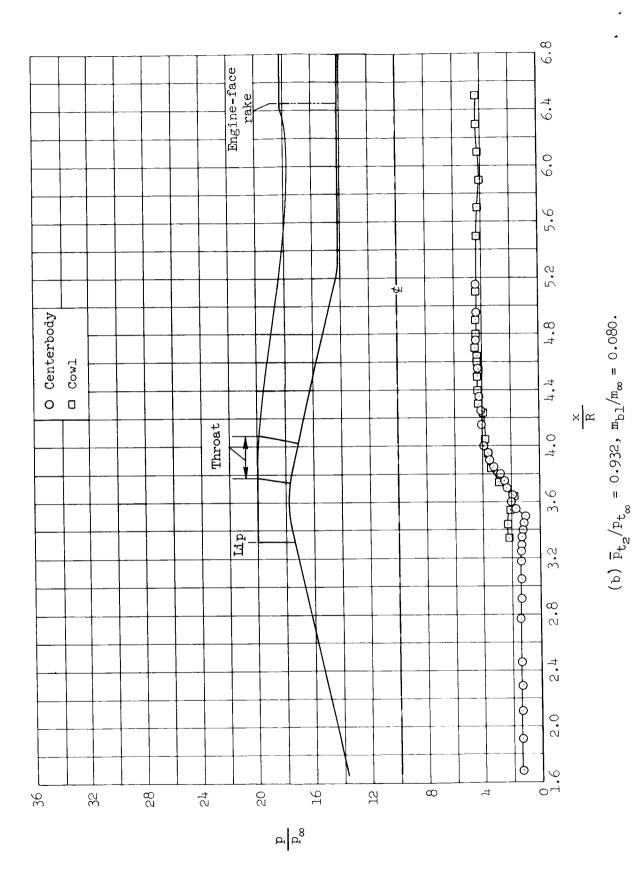


Figure 34.- Continued.

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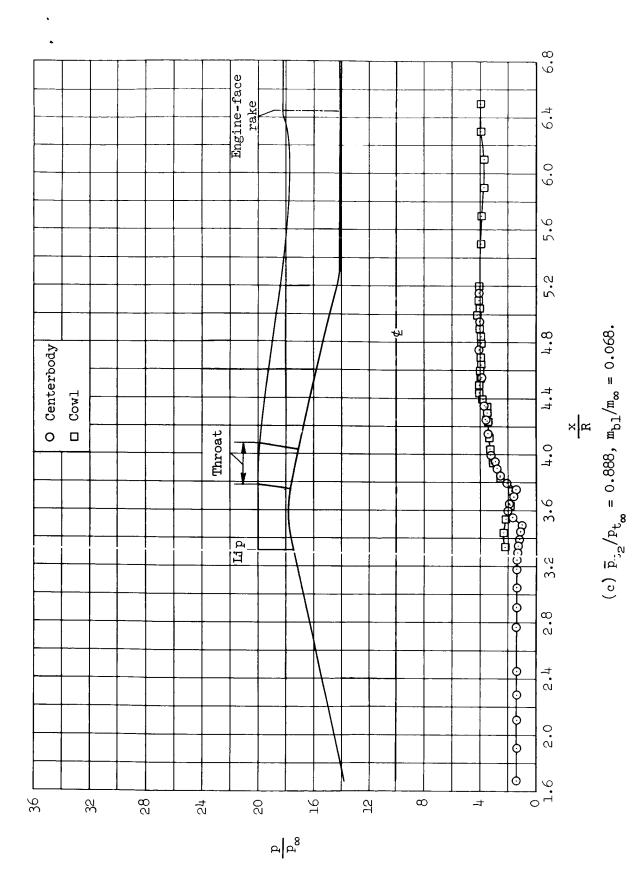


Figure 34.- Concluded.

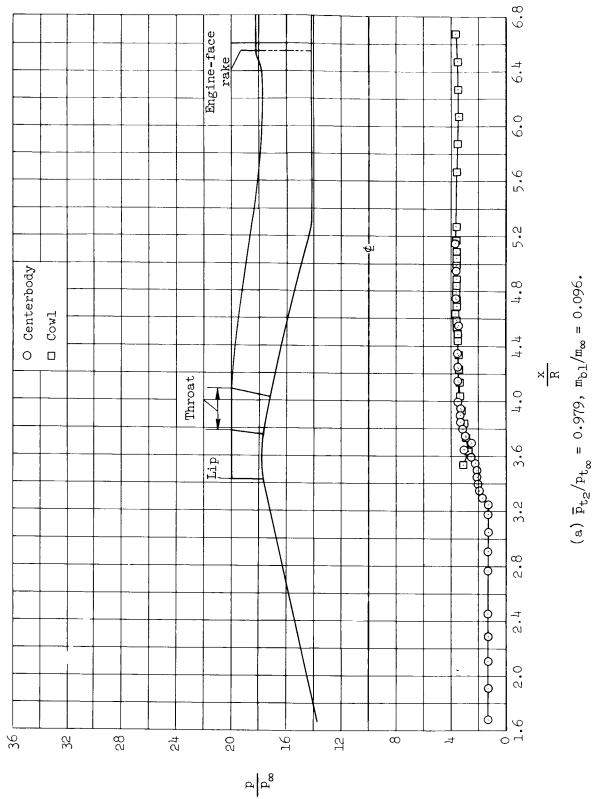
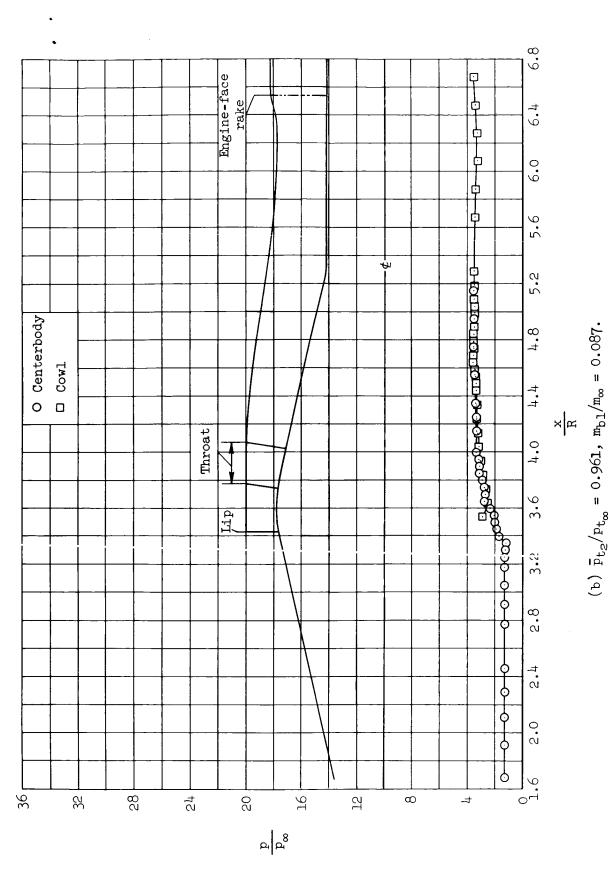


Figure 35.- Static pressure distribution, 1.50 D inlet with vortex generators; bleed exit setting B,  $(x/R)_{1ip} = 3.420$ ;  $M_{\infty} = 1.55$ ,  $\alpha = 0^{\circ}$ .



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Figure 35.- Continued.

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Figure 35.- Concluded.

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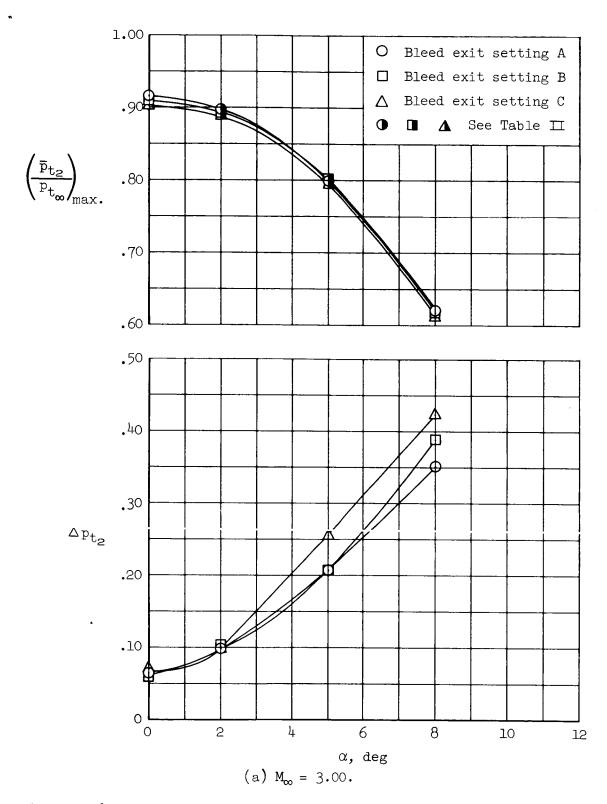


Figure 36.- Maximum performance at angle of attack, 1.50 D inlet with vortex generators.

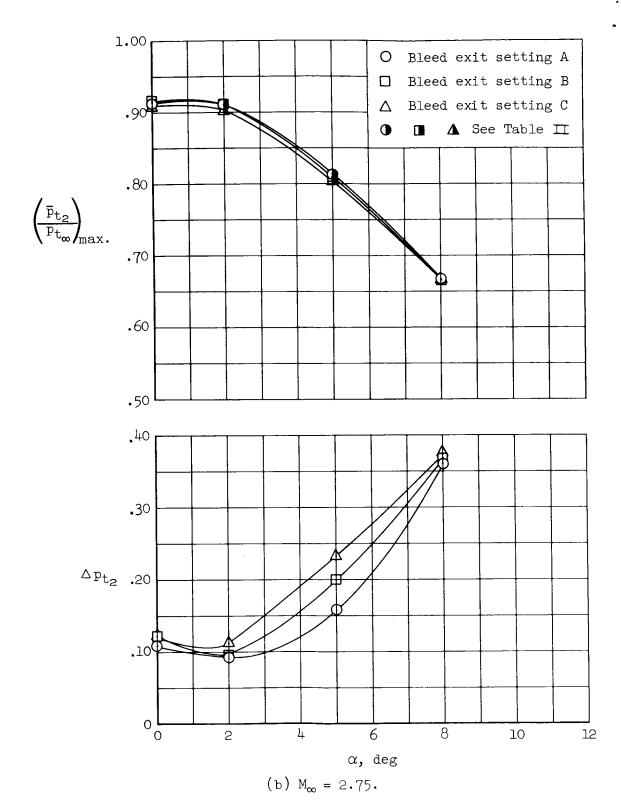


Figure 36.- Continued.

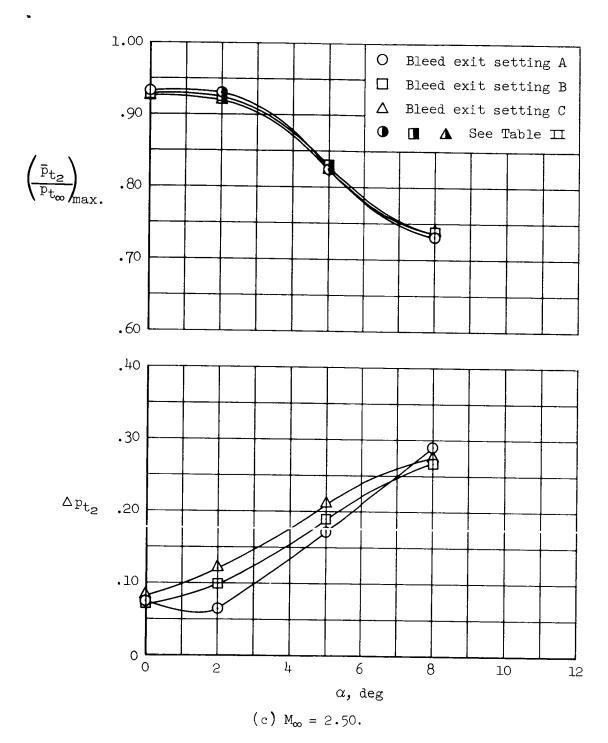


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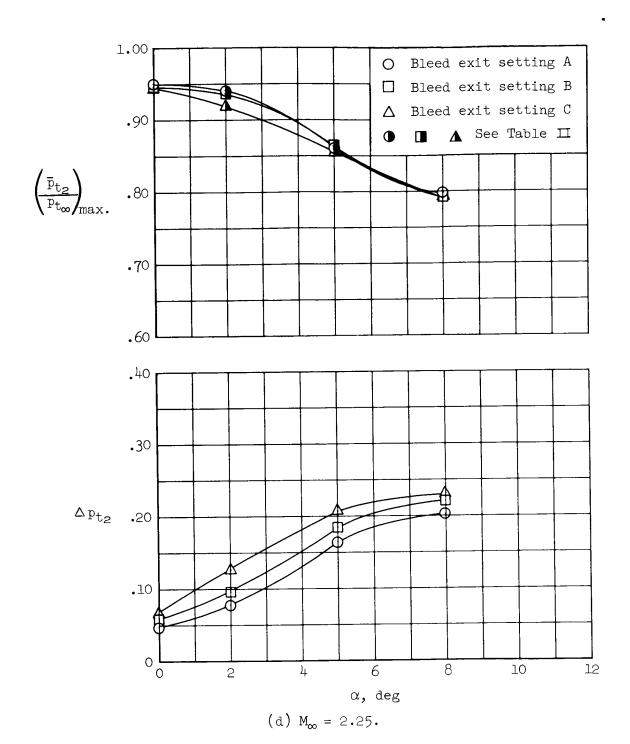


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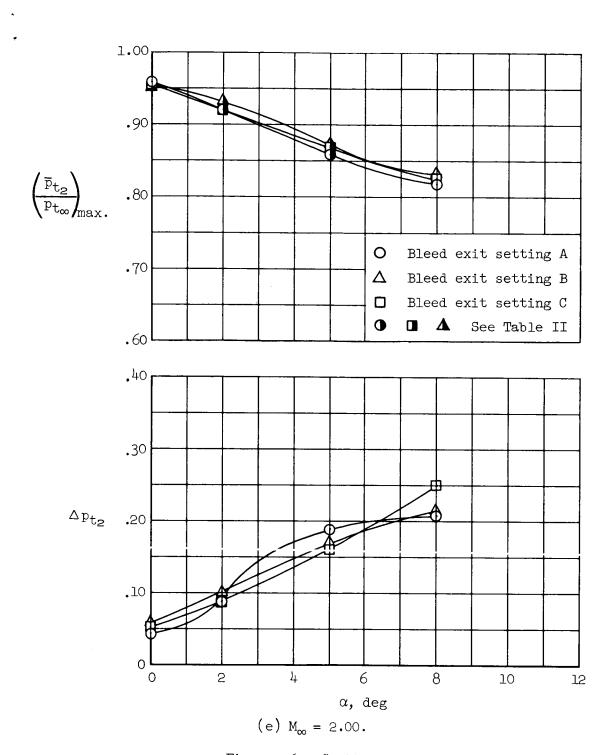


Figure 36.- Continued.

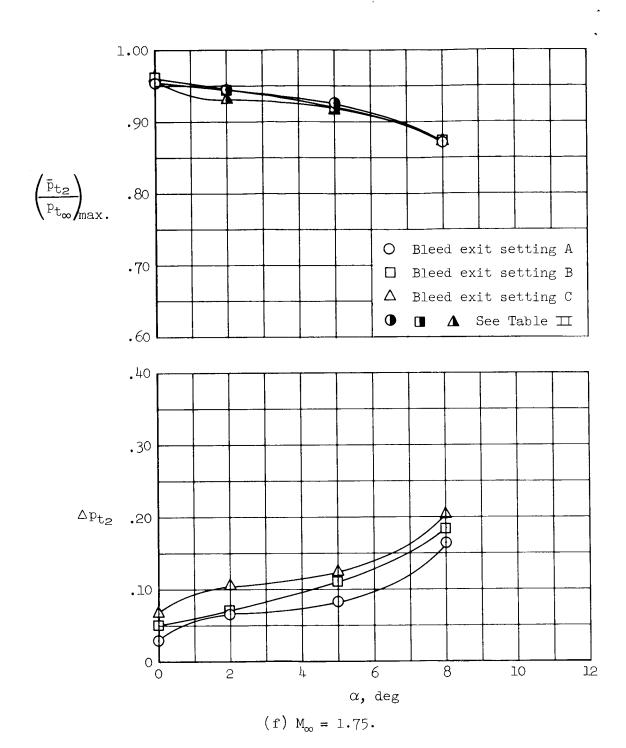


Figure 36.- Continued.

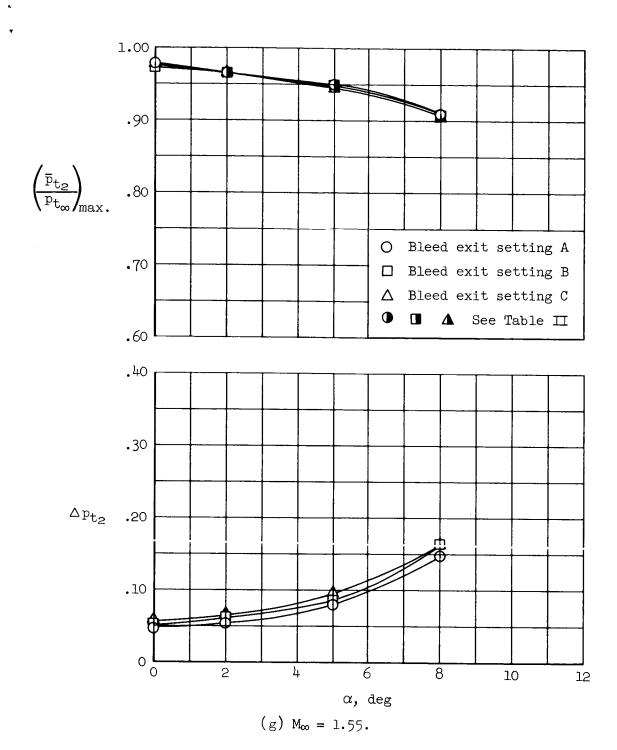


Figure 36.- Concluded.

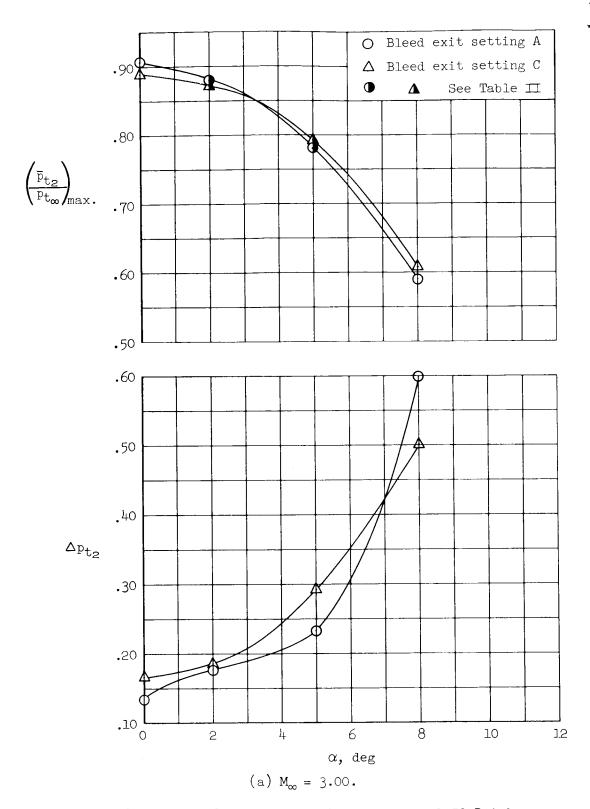
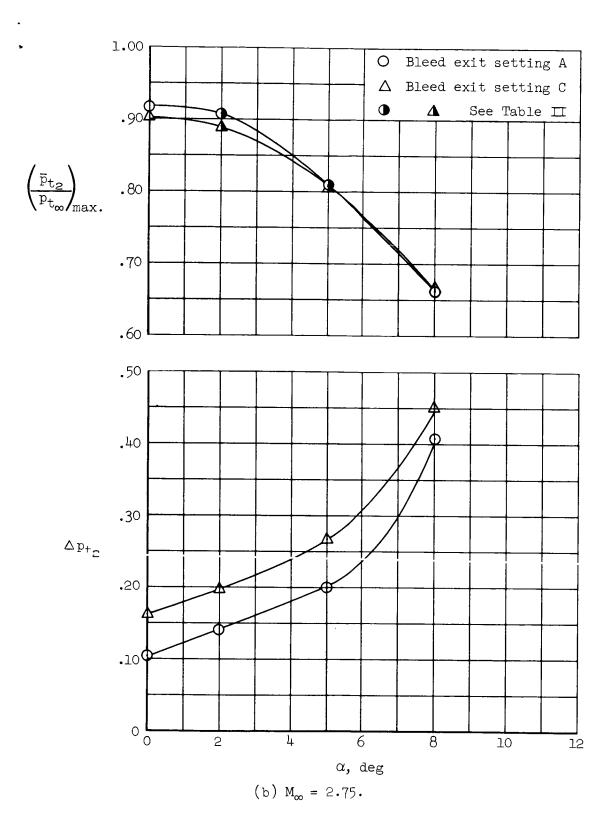


Figure 37.- Maxumum performance at angle of attack, 1.50 D inlet without vortex generators.



(b) Figure 37.- Continued.

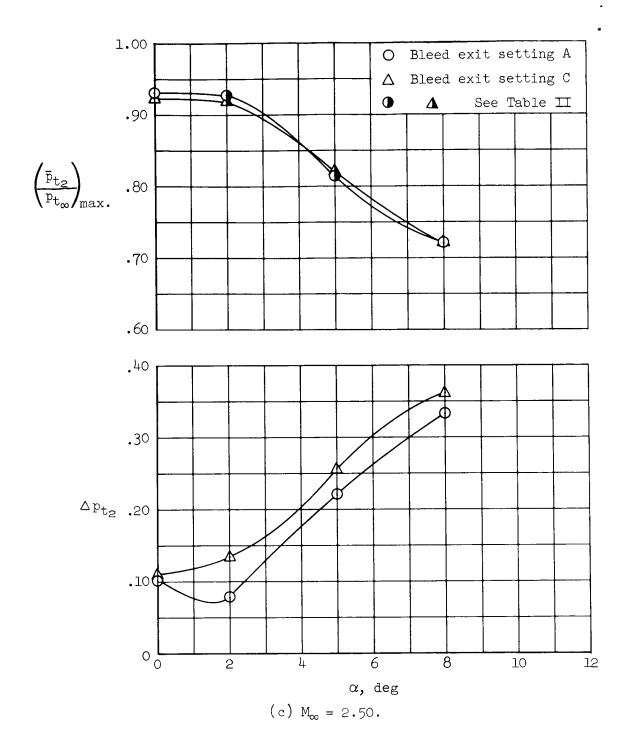


Figure 37.- Continued.

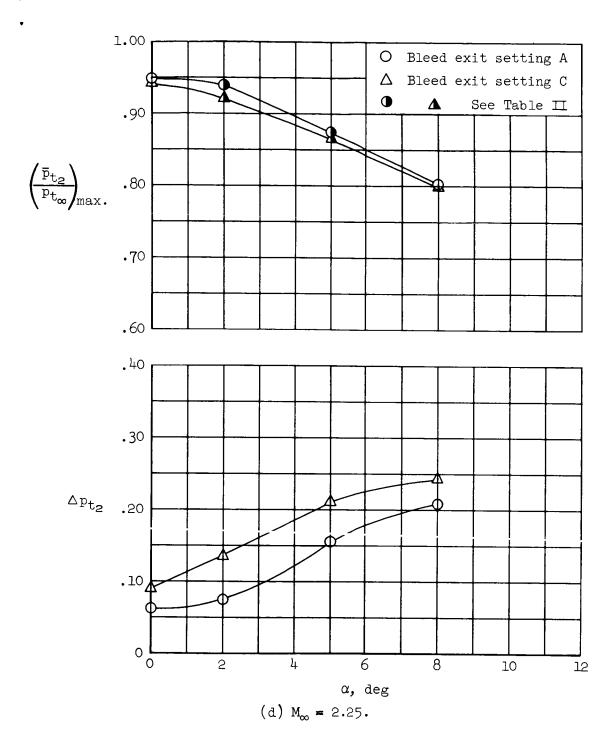


Figure 37.- Continued.

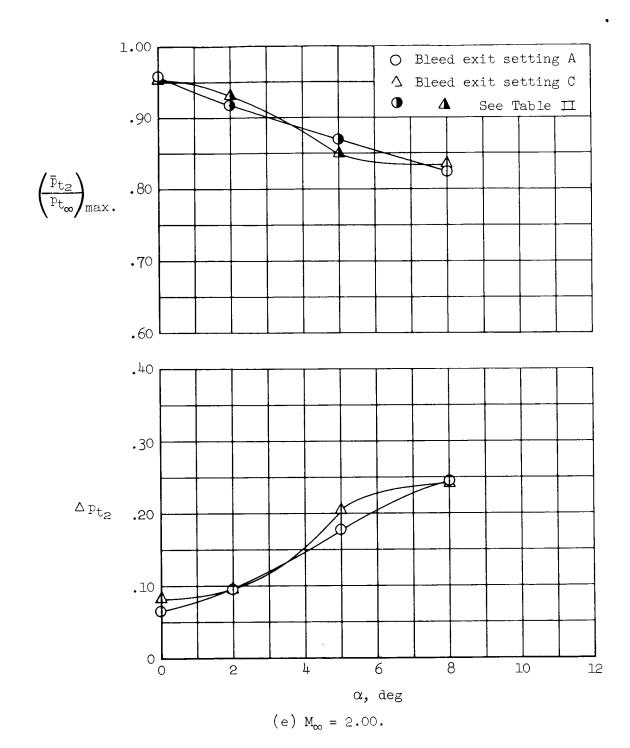


Figure 37.- Continued.

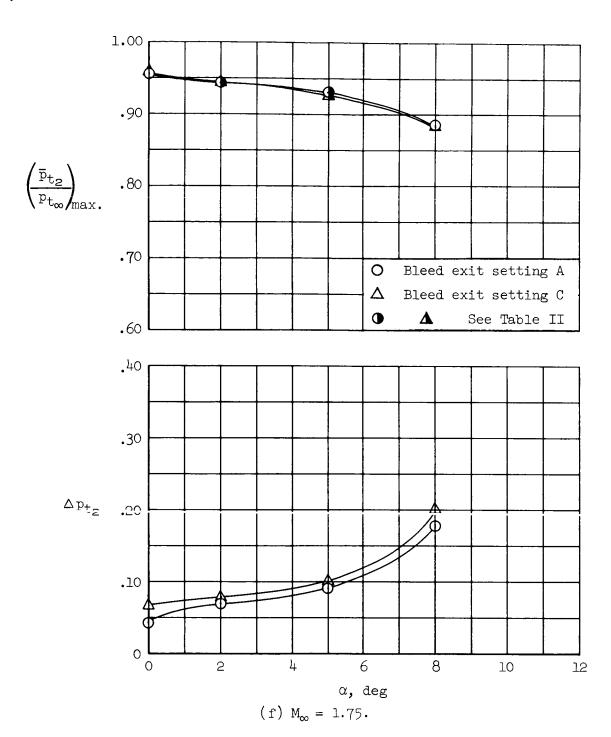


Figure 37.- Continued.

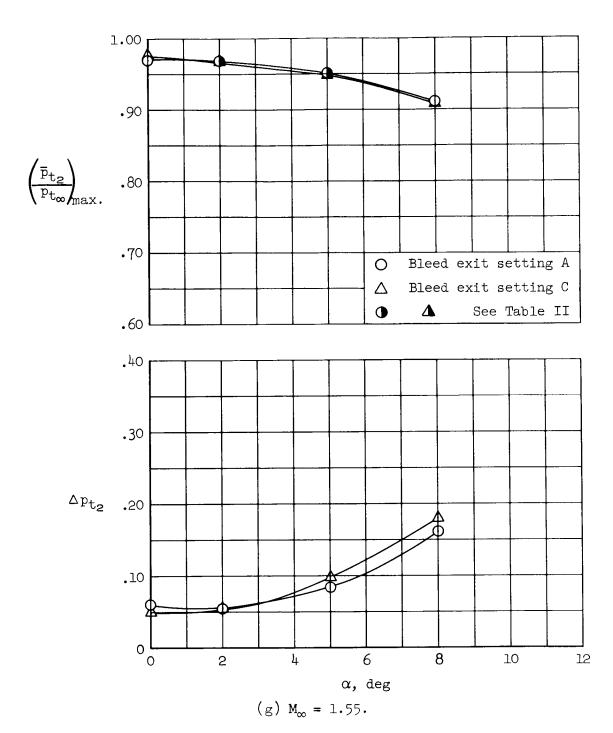
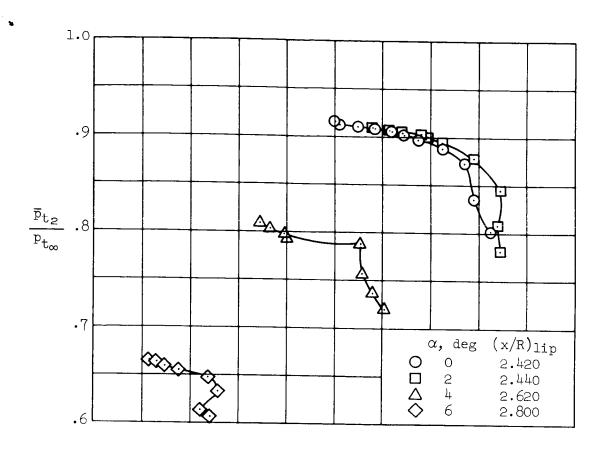


Figure 37.- Concluded.



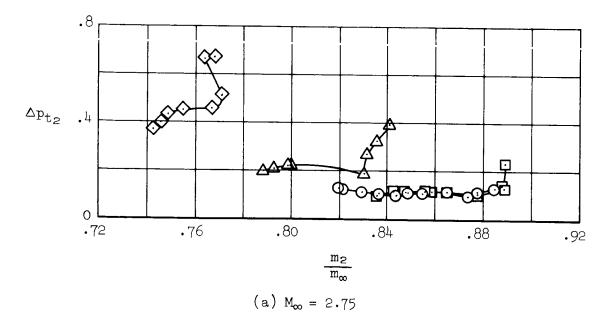
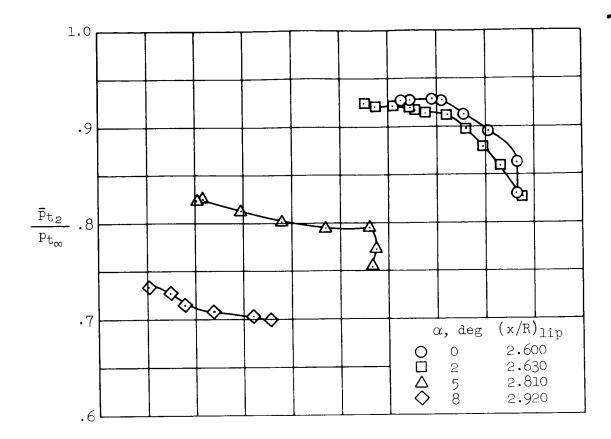


Figure 38.- Supercritical performance at angle of attack, 1.50 D inlet with vortex generators; exit setting B.



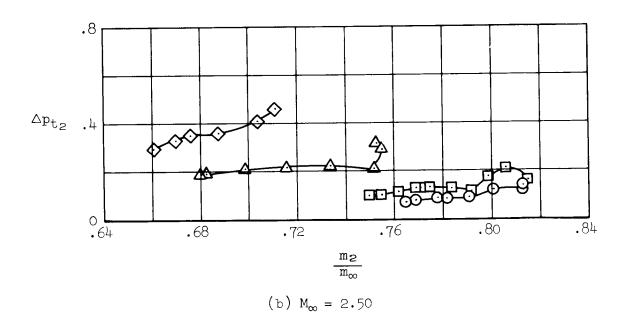
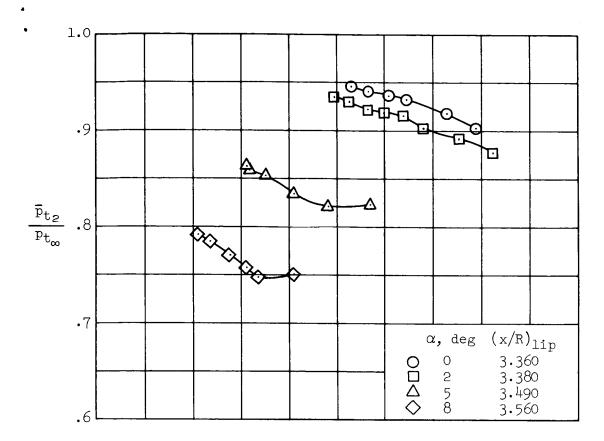


Figure 38.- Continued.



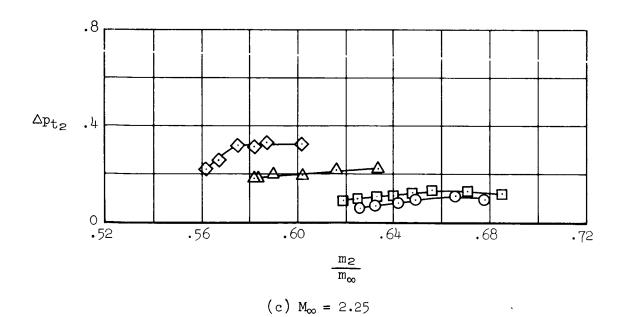
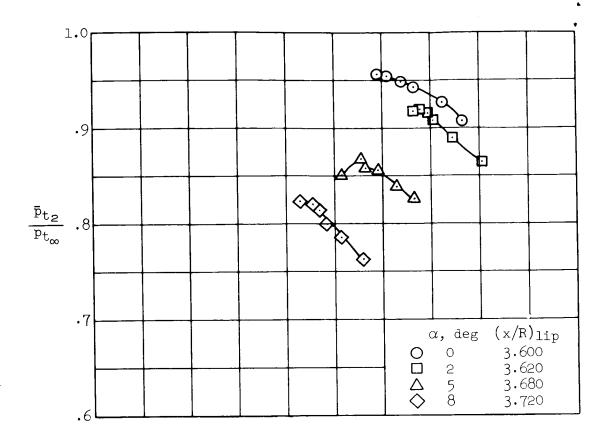


Figure 38.- Continued.



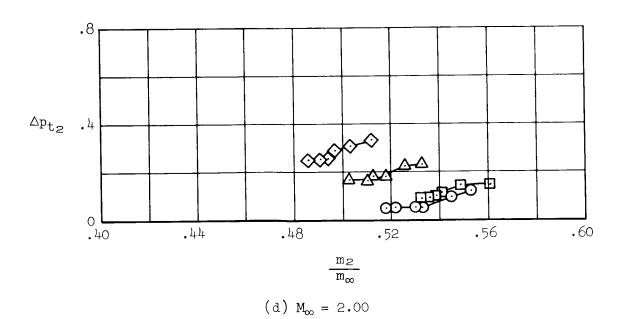
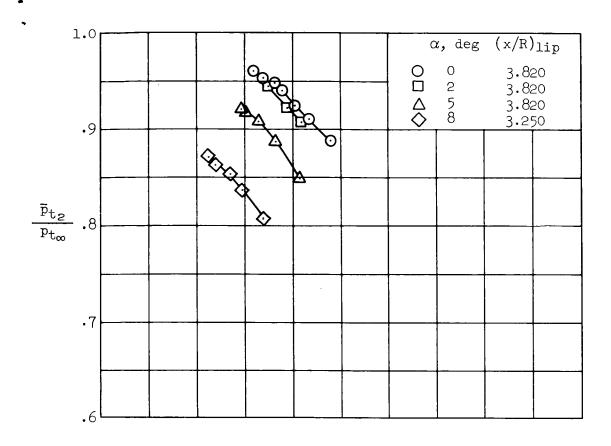


Figure 38.- Continued.



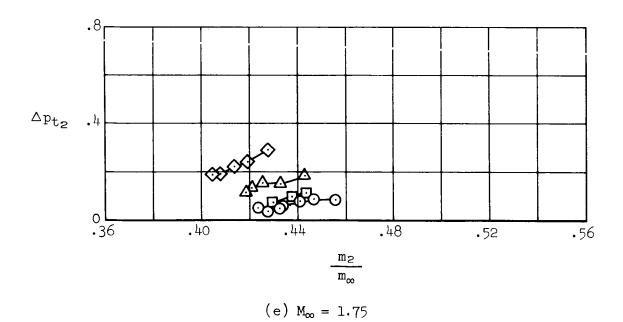


Figure 38.- Concluded.

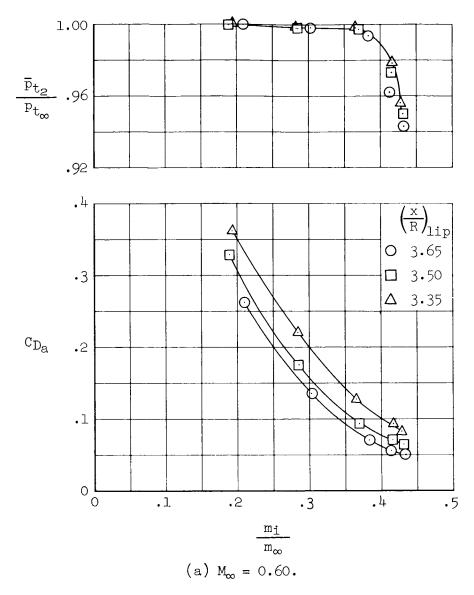


Figure 39.- Transonic total-pressure recovery and additive drag,  $\alpha$  = 0°.

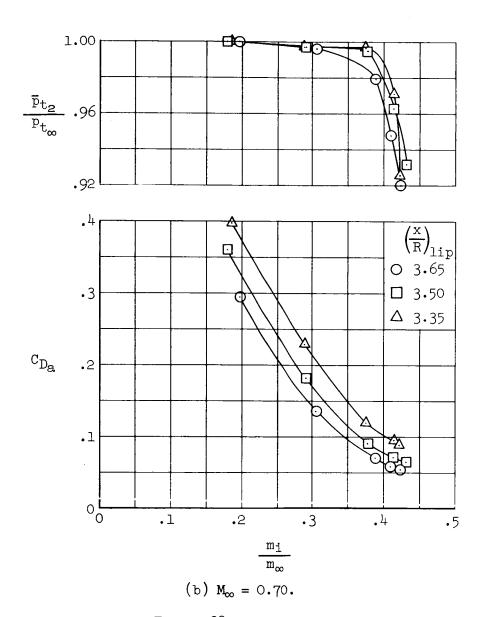


Figure 39.- Continued.

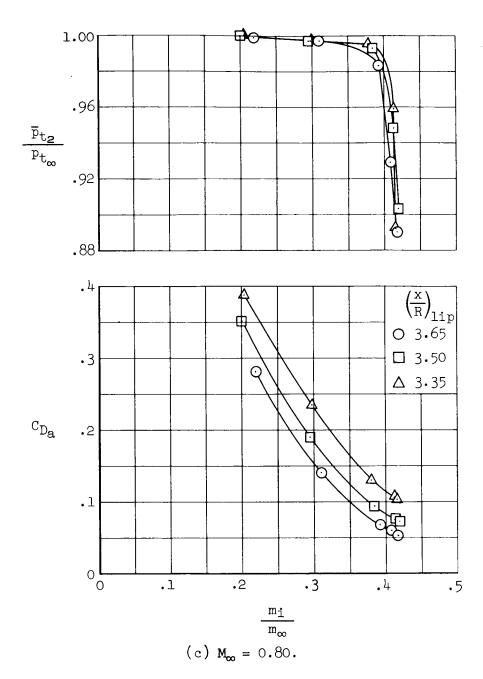


Figure 39.- Continued.

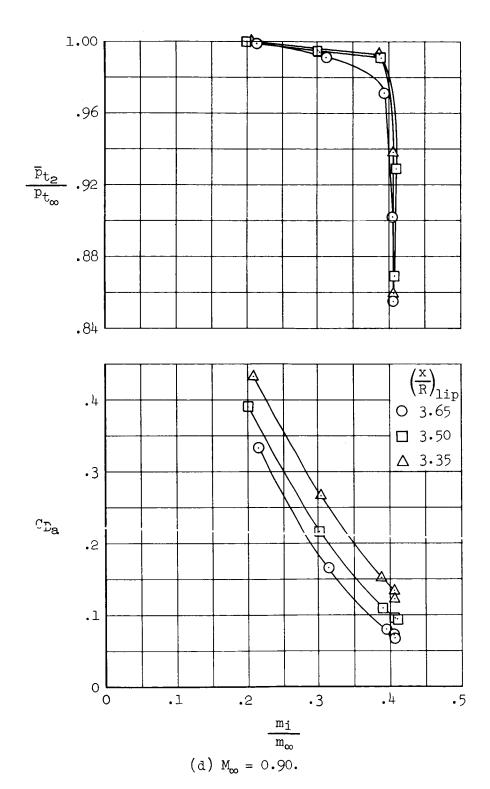


Figure 39.- Continued.

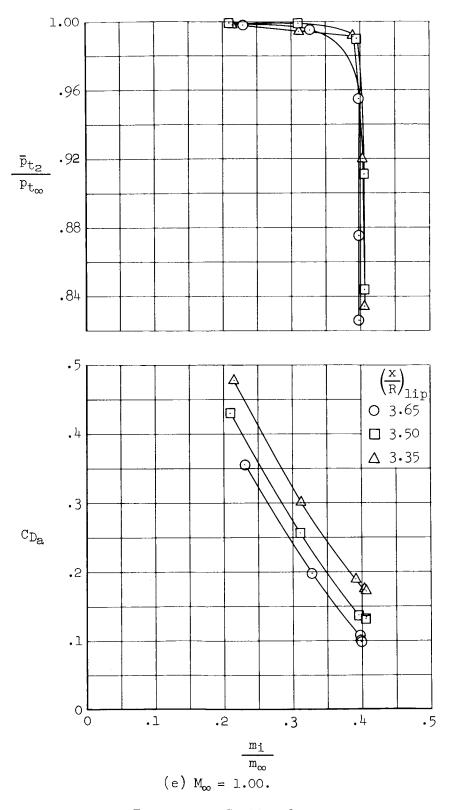


Figure 39.- Continued.

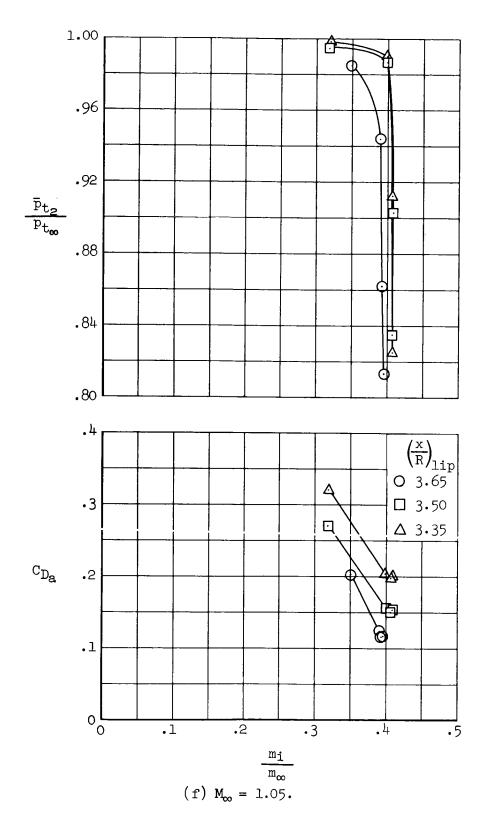


Figure 39.- Continued.

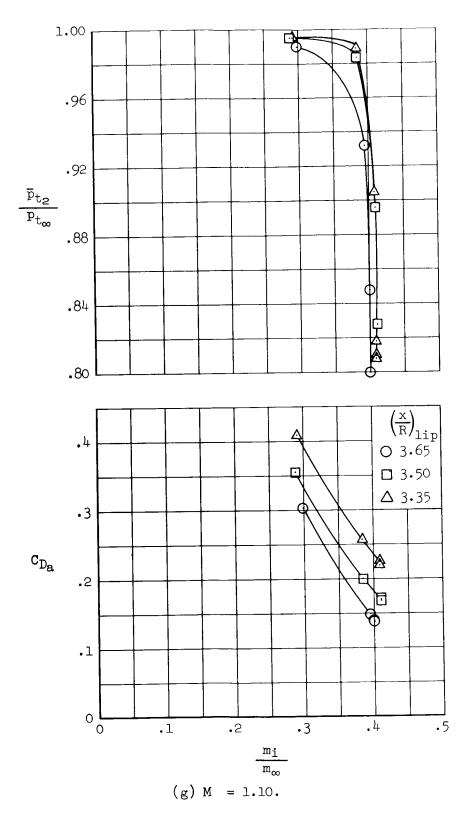


Figure 39.- Continued.

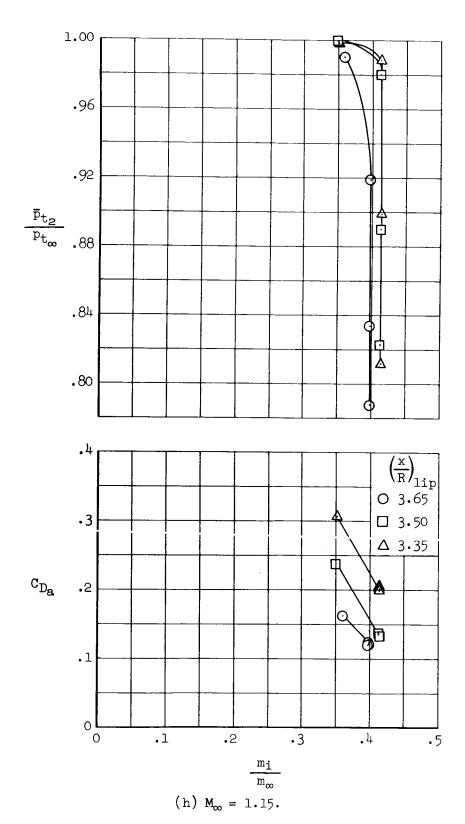


Figure 39.- Continued.

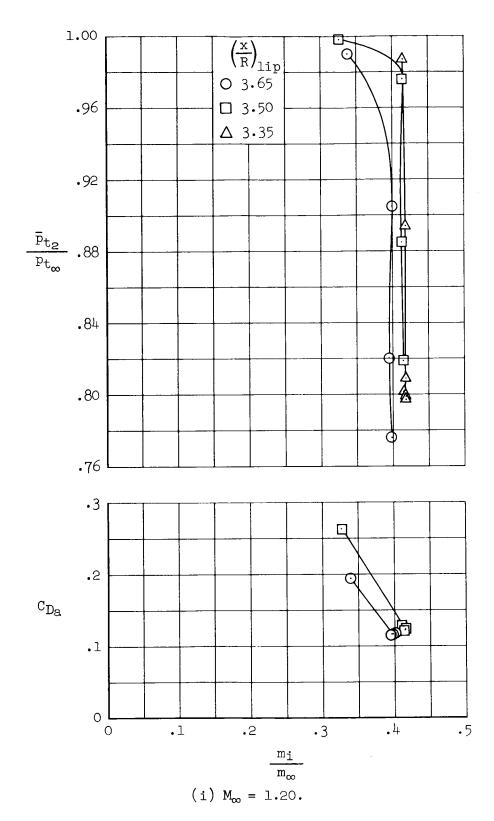
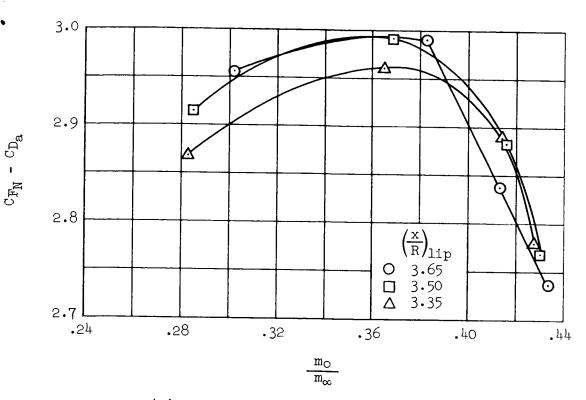


Figure 39.- Concluded.



(a) Net propulsive thrust,  $\rm M_{\infty} = 0.60.$ 

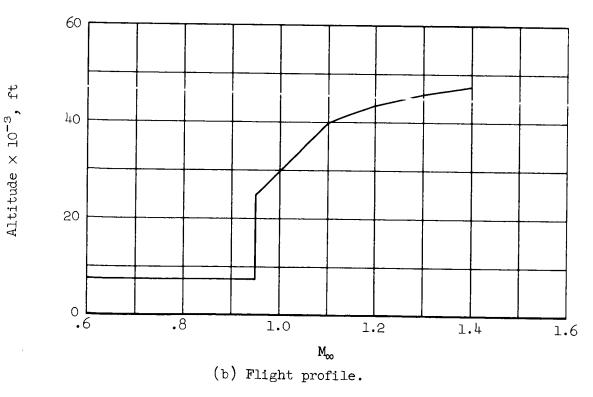


Figure 40.- Transonic optimization.